FOOD MANUFACTURE

Incorporating Food Industries Weekly

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Index to Advertisers, see pages iv & vi

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FOOD MANUFACTURE

Incorporating Canning, Packing and Preserving

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CONTENTS

	Page
Editorial - - - - - -	173
The Salmon: The Salmon Canning Industry. *Elliot B. Dewberry, M.R.I.P.H., M.R.San.I.* - - -	176
Sugar from Wood - - - - -	179
Food Legislation: In Peace and War. *Thomas McLachlan, F.I.C.* - - - - -	180
Substitutes in Ice Cream. *L. J. Hynes* - - -	182
Ministry of Food: Latest Statutory Rules and Orders -	184
Letters to the Editor - - - - -	185
Book Review - - - - -	186
Calcium in Fortified Bread - - - -	186
Macaroni Products. *Specially Contributed* - -	187
Vegetables as Protective Foods - - -	189
The Preparation and Cooking of Green Vegetables -	190
News from the Industry - - - -	191
Information and Advice - - - -	195
Recent Patents, Trade Marks, and New Companies -	196

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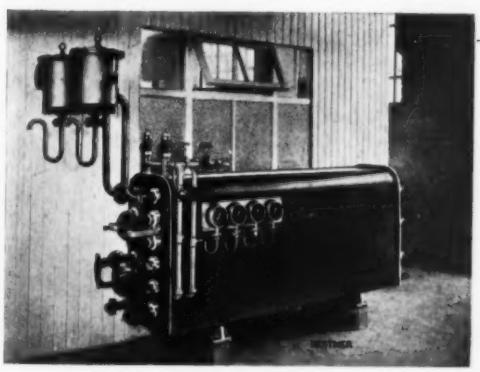
The Editor will be glad to consider contributions from those engaged in the Food Industry. Articles intended for publication should be of a practical nature and accompanied by photographs or drawings when possible.



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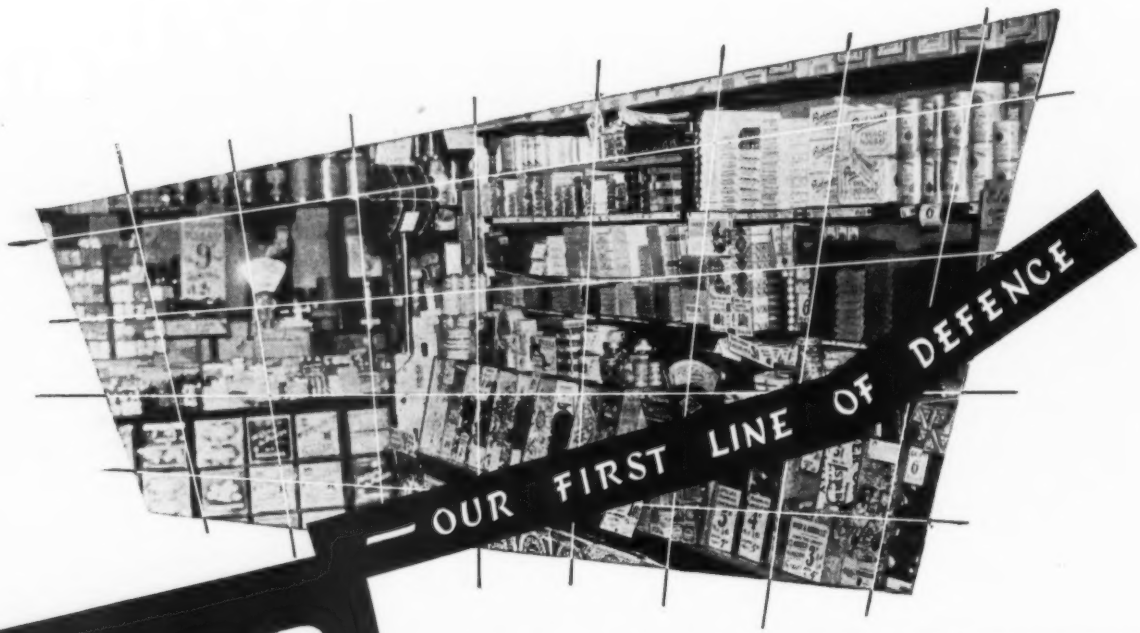

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Facing first page of Editorial.

FOOD MANUFACTURE

Vol. XVI, No. 8 August 1, 1941

Lord Woolton's Message to Food Workers

IT IS an inspiring message to food workers which Lord Woolton has caused the Ministry to send to every food factory and to every food machinery maker. A copy should be found in a prominent place in every such factory. Those readers who have not received a copy should apply to the Ministry of Food or to FOOD MANUFACTURE for one.

Vitamin B_1 in White Flour

To use an insect as a test animal is no novelty, although this method has been little used. Dr. G. Fraenkel and M. Blewett, of the Department of Zoology and Applied Entomology, Imperial College, London (*Nature*), describing experiments suggested by the decision of the Ministry of Food to "fortify" white flour by the addition of vitamin B_1 and salts and by the criticism raised against this proposal, point out that the flour beetle, *Tribolium confusum*, has proved to be a very satisfactory test animal owing to its small size, its short life-cycle, and its ability to grow normally on substances with a water content of only 10 to 15 per cent.

From experiments with this beetle, the authors found that addition of pure vitamin B_1 (aneurin) to patent flour does not in the least alter its nutritional qualities; addition of riboflavin, however, to patent flour containing vitamin B_1 causes a very startling improvement. The results obtained with *Tribolium confusum* fully agree with those recently reported by H. Chick on the white rat. In both cases the nutritive value of National straight-run flour, even when supplemented with vitamin B_1 and salts, is markedly inferior to that of wholemeal flour, and Chick's suggestion that this may be partly due to deficiency of riboflavin has proved to be correct, as most of this deficiency is corrected by adding riboflavin.

Supplementing white flour with vitamin B_1 would leave the deficiency in riboflavin unremedied, and this deficiency is serious.

Soya Bean Culture in Great Britain

Is it possible to grow soya beans successfully on a commercial scale in Great Britain? Dr. H. H. Mann, of Woburn Experimental Station, Bletchley, writing in *Nature*, (1941, **147**), concludes that the possibilities for the future seem to depend on the development of types which yield more heavily in our climate than any of those tried hitherto and which are still early enough to ripen at least by the first week in October, and on finding cultivation methods which give again a larger yield than those he has hitherto adopted.

Dr. Mann is not unhopeful of the chances in both these directions, but is of the opinion that a very great deal of work will be required before the cultivation of the soya bean can take a large part in ordinary farming practice even in the South of Great Britain. The yields obtained at Woburn are not encouraging for the development of a commercial soya bean culture. In spite of the fact that the seed contains between 16 and 20 per cent. of oil (of which it is usually counted that 15 per cent. is commercially recoverable) and that it has certain other advantages, such as its tasty character, it would (says Dr. Mann) pay better to grow the ordinary field bean unless the yields obtained can be increased very largely.

The "H.-T. S.-T." System

The Ministry of Health has decided to give official recognition to the high-temperature short-time process of milk pasteurisation. This announcement will be welcomed by a large number of food manufacturers.

At present the Milk (Special Designations) Order permits the description "pasteurised" to be applied only to the "holder" process, and requires such milk to be held at a temperature of 145° to 150° F. for thirty minutes.

The Ministry has now drafted an Order (under the Food and Drugs Act, 1938) which will come into operation at an early date, permitting the description "pasteurised" to be applied also to milk that has been held 162° F. or over for at least fifteen seconds.

Local authorities will be responsible for licensing high-temperature short-time plants, and the Ministry suggests that before issuing a licence the medical officer of health or the sanitary officer should see the plant at work. Every plant must be fitted with a recording thermometer and with a device capable of rejecting milk that has not been held at the requisite temperature for the prescribed period.

Among the reasons that have induced the Ministry to give official recognition to the process are that during several months of the year working hours in dairies and creameries are restricted by reason of the black-out, and that the speedier process will help to minimise the effects of the labour shortage.

The Ministry is satisfied that "H-T. S.-T." plants require less space than do "holder" plants and that the apparatus is simpler. Many of the holder types of plant can be converted to the speedier system with comparatively little trouble or expense.

Since the outbreak of war a number of "H.-T. S.-T." plants have been installed in different parts of the country, but it has not been permissible to describe the milk processed by them as "pasteurised". The process has been recommended by the National Institute for Research in Dairying for the treatment of cheese-milk and is used in many creameries. The system has been legally recognised in France and certain other countries for several years.

The Utilisation of Carotene

Carotene is a less effective source of vitamin A activity for the human being, and may be a very much less effective source, than the preformed vitamin, states A. L. Bacharach in *Chemistry and Industry* (June 7). In calculating food values from tables of nutrient analyses, including vitamin contents, it is considered advisable to equate not less than 2 micrograms of carotene to 1 international unit of vitamin A. Where an appreciable proportion of the provitamin consists of compounds containing only one β-ionine ring, a corresponding further increase must be made in the amount of carotene taken as equivalent to 1 international unit.

Mr. Bacharach points out that "vitaminised" margarine may have one advantage over butter, apart from the fact that its vitamin A activity is constant all the year round. It is understood that the vast bulk of the margarine now available is enriched—to the extent of 500 I.U. per ounce—entirely with preformed vitamin A, so that there is no need for converting its carotene to vitamin A and thus leaves no doubt as to its effective biological activity.

Plankton Again

In the February issue of FOOD MANUFACTURE attention was called to the possibilities of plankton for human food. In May, Sir John Graham Kerr suggested in Parliament and also in a letter to *The Times* that biologists and engineers should enquire into the possibilities of collecting and utilising as a food stuff the vast reserves of marine plankton.

Recently, Professor Hardy (*Nature*, 1941, **147**) pointed out that the plankton off the Scottish coasts is richer than that on which previous calculations as to availability or the amount of sea-water to be strained to obtain sufficient to support an adult for one day, have been based. In many of the long sea-locks plankton abounds, and a strong tidal flow exists which Professor Hardy suggests would facilitate a semi-automatic collection of the plankton by means of tidal straining with nets. This, he considers, is a feasible proposition and, developing the theme, calculates that in many tidal locks the use of swing nets would yield 5¼ cwt., dry weight, of plankton per day, or enough to feed 357 people. As his figures were purposely based on those of Clarke (cited in FOOD MANUFACTURE, April issue) which are considered to be low compared with what might reasonably be expected off the Scottish coast, an even higher yield might be obtainable in this area, which is, incidentally, comparatively free from enemy action. If trials were to bear out the estimates given, one thousand nets, requiring the attention of 200 men, would provide 26½ tons dry weight of plankton per day, or enough food for 35,700 people. We mentioned in our previous note that before we can eat our plankton we must catch it. By the use of nets the calculated straining efficiency is only about 20 per cent., but in view of the efficiency of modern separators, boats fitted with these might be used to supplement the output. The prominence of those putting forward this suggestion and the importance of the food supply problem make the proposition one that should not be lightly set aside. Certain large food firms might even have much of the equipment necessary to carry out the investigational work and thus be in an advantageous position to supplement their raw material supplies for manufactured foodstuffs. Professor Hardy considers that the plankton food problem might well be investigated this summer and makes practical suggestions as to how this might best be carried into effect and, in view of his specialised knowledge of the subject, his points are worthy of the closest attention from far-seeing foodstuff technologists and manufacturers.

Factory Ventilation and Heating

An important contribution to the study of the principles of factory ventilation and heating is that of Dr. T. Bedford, writing in *Occupational Psychology*, **15**, 2.

In the course of his observations some interesting facts emerged. One of the main requirements of a satisfactory heating and ventilation system is the control of relative humidity, which should be preferably well below 70 per cent. At about 61° F. a change of roughly 24 per cent. in the relative humidity would be required to compensate for an alteration of only 1° F. in the room temperature. Hence a change of humidity that would be insignificant from the standpoint of warmth may have a distinct impression on one's feeling of freshness. Another point that Dr. Bedford stresses is the necessity of adequate but variable, rather than monotonous, air movement. Regarding temperature he concludes that the average temperature of the walls and other surfaces should not be appreciably lower than that of the air, and that the air at head-level should not be distinctly warmer than that near the floor. The heads of the occupants should not be exposed to excessive radiant heat. For individuals doing light work the air temperature in winter should be as nearly as possible 65° F., for more active work 60° to 65° F., and for heavy muscular work from 55° to 60° F.

Vegetables as Food

The article in *Nature*, **147**, 513, "Vegetables as Food", by Dr. Magnus Pyke, produced a mild flutter in the nutritional dovecotes. Drs. V. H. Booth, L. W. Mapson and T. Moore, of the Nutritional Laboratory, Cambridge, in a joint letter, and Miss Mamie Olliver and Mr. W. B. Adam in another, make allusion, among other things, to Dr. Pyke's "exaggeration" of the losses of vitamin C in vegetables during their manipulation from garden to table, either direct or via the can.

Dr. Pyke, in his reply, published in the same journal, suggests that while losses may be minimised by appropriate precautions, they are still very high, and he deprecates such losses, although he agrees that the partially depleted vegetables may still adequately supply vitamin needs when taken in proper quantities.

Our own view is that a frank exposition of the causes and extent of vitamin losses in vegetables does not imply the underestimation of their antiscorbutic value; on the contrary, its tendency should be to acquaint people of the fact that they are handling precious material.

A timely note on the preservation of vitamins and salts in the processes of preparing green vegetables for the table has been drawn up by the Medical Research Council's Accessory Food Factors Committee. We publish it in this issue of FOOD MANUFACTURE, as well as a chart devised by Dr. Pyke showing how valuable even cooked vegetables are as regards their vitamins.

Mislabelling Prosecution

A product found on analysis to contain over 78 per cent. skim milk was the subject of a prosecution recently, the defendants being fined £20 and £7 7s. costs.

The prosecution, brought by the Aylesbury County Council, alleged that the product was sold under a misleading label and was falsely described in an advertisement. The defendants pleaded guilty.

Opening the case, the Chief Officer said: "In reviewing the circumstances of the case, I must regard it as very serious, in fact, one of the most serious cases of mislabelling I have yet had to bring before the court." The article was sold as *café au lait*, in cartons on which it was stated to be "coffee, milk and sugar in convenient powder form". The analysis was 78·3 per cent. skim milk, 13 per cent. coffee, 8·7 per cent. sugar, and 250 parts per million saccharin.

Another remark by an officer was to the effect that there was nothing on the carton which stated the precise nature of the article. This may be said of many products and, although they may be perfectly wholesome and of some value dietetically, the consumer is surely entitled to get some idea of the nature of the article for which he pays his money. Such general terms as "vitalizing", etc., are really not good enough.

Fluorescence Analysis

The ever-increasing scope of fluorescence analysis in essence and food stuff examination is suggested by a paper by K. Leupin and J. Steiner on the examination of cinnamon bark in "filtered" ultra-violet light (*Mitt. Lebensm. Hyg.*, **30**, 217). The two cinnamon barks, *Cortex cinnamoni cassiæ* and *Cortex cinnamoni ceylonici*, show no difference in fluorescence under the microscope, but if the powders are treated with two to three drops of 10 per cent. barium hydroxide solution the two powders differ so much in fluorescence that 10 per cent. of the former in the latter can readily be detected. As the oil of the latter is non-fluorescent, whereas the oil of the former has a strong bluish-green fluorescence in acetone, as little as 1 per cent. of oil of *cinnamoni cassiæ* in oil of *cinnamoni ceylonici* is detectable. A. Montefredine, using "filtered" ultra-violet light, claims that artificially coloured alimentary pastes always show a marked fluorescence (*Chim. et Ind.*, **40**, 976).

Unfair Advertising Again

It is gratifying to note that the dry bones of control of advertising are stirring. At the time of writing, the second reading of the Pharmacy and Medicines Bill has been read.

On the food side, the Committee of the Advertisement Investigation Department of the Advertising Association is already actively collaborating with the Ministry of Food with regard to food advertising.

There was a recent example of what amounts to almost incredible carelessness, to say the least, in making claims of vitamin content in a manufactured food. The vitamin was doubtless added, but when it got to the consumer it had disappeared!

It has been stated that there is no evidence that manufacturers are unwilling to modify excessive claims or eliminate statements which cannot be substantiated. We should think not! But there surely is such a thing as seeing that the stuff that is put in stays in, and moreover that it is in such quantity as to be of value.

It is not only over vitamin claims that attention should be given. Last month we commented upon some other forms of advertisements which give a wrong impression to the layman. Examples may be seen in most daily and weekly papers.

During the second reading of the Pharmacy and Medicines Bill, a member complained that the Bill would not prevent certain kinds of advertisements no less objectionable than those to be prohibited. He mentioned advertisements which exploited the emotion of fear by offering preventatives of illness or social handicap. Not only are these found in patent medicine, but food, advertisements.

The Wheeler-Lea Amendment

The passage in March, 1938, of the Wheeler-Lea Amendment to the U.S.A. Food and Drugs Act gave the Federal Trade Commission a greatly extended jurisdiction over misleading advertising, and has considerably cleaned up food advertising in America. Canada has recently followed the lead in connection with vitamin claims.

Many examples of the taboos in the U.S.A. on claims for food values might be cited. Those in connection with bread are numerous, even the claim that it is a fat reducer! Claims as to the effect of its natural vitamin content are also strictly curtailed.

In the confectionery section, it is forbidden to represent that the product is composed of malted milk—and so on. In many of the cases where action has been taken under the Wheeler-Lea Amendment, similar examples of such advertising may be found in this country.

The Committee of the Advertisement Investigation Department, however, is of the opinion that there is insufficient ground for the imposition of any such measures in the United Kingdom and that the matter may be met by the goodwill of advertisers acting in co-operation with the Advertising Association.

We trust that such optimism will be justified by results.

Artificial Tea and Cinnamon

Hungarian merchants have reported that the Nazis are pushing the use of peppermint leaves as a substitute for china tea. This was introduced before the war, but the demand is expected to continue not only for the duration of the conflict, but also after the cessation of hostilities. The production of the *ersatz* tea rose from 379 metric tons during 1938-1939 to some 1,500 metric tons in the 1939-1940 season.

Artificial cinnamon containing 96 per cent. cinnamic aldehyde with 4 per cent. eugenic acid incorporated in some 3 to 4 per cent. of powdered hazel-nut shells has also made its appearance in the Greater Reich. The carrier is coloured to resemble the natural product and, after dyeing and drying, is mixed with the essence. Some 0·2 per cent. of the genuine Ceylon cinnamon oil is added to give the product the delicate fragrance of the natural cinnamon.

The Miner's Food

Commenting upon absenteeism in coal mines in a letter to *The Times* of July 5, Sir Francis Joseph raises the question of the miner's food, and says that the miner considers that rationing has hit him harder than most workers. He believes that beef, bacon and cheese give him the strength to do the job. He doesn't know much about vitamins and it would be wasting time to suggest that alternative foods are as good as those to which he has been accustomed. Sir Francis calls attention to the fact that every munition works has its canteen where good meals can be obtained—meals which do not call on the domestic supply of rationed foods. In view of this, the miner has a good case that the munition worker is better off than he is, and the question is asked, "Is it not possible to give miners—our industrial front line—extra rations which could be handed to him just before he goes down the pit?"

Lord Woolton Replies

Lord Woolton replied to Sir Francis in *The Times* of July 7, and pointed out that the question of supplementary rations for particular classes of workers was one on which he had sought and accepted the advice of the T.U.C. The Ministry of Food undertakes to secure that where industry—including the mining industry—creates the organisation for feeding its employees at their works, the Ministry will provide adequate supplies of rationed foods. Lord Woolton pointed out, however, that the miners present a special problem because cooking facilities cannot be used underground and the miners cannot get to a central canteen. For this reason the miners were given an extra ration of cheese. However, something more could be done.

The Minister said it was no use talking about the traditional dietary of miners in these times, but there was good food for everybody if it were used properly. He asked that, in order that miners shall be able to have the full benefit of the available food, the mining industry should arrange that, for the larger pits, there should be pit-head canteens. He definitely promised that if this were done he would undertake to see that the miners have food suitable for their work and by this means give them facilities comparable with other industrial workers.

To this letter Sir Francis Joseph replied (July 9), pointing out some of the difficulties and saying that the knowledge that the Minister of Food is helping the industry will convince the miner that he is getting a fair deal as regards food.

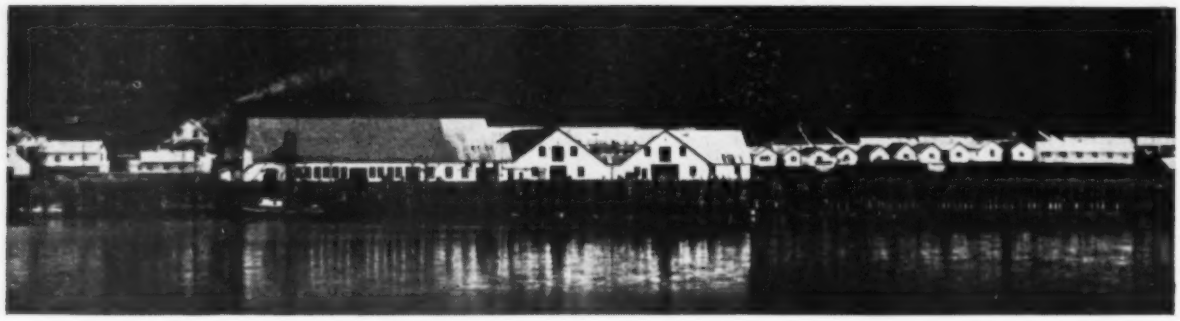
This is a most satisfactory outcome of a letter on a genuine difficulty and the prompt attention accorded it. Such correspondence should convince the general public that these difficulties are being tackled energetically and fairly.

Where Do the Sweets Go?

One of the old-time comic singers used to propound the question, "Where do flies go in the winter-time?" It was probably no more knotty a question for the man-in-the-street than the ones heard at the present time wherever men (and women) do congregate: "Where do the sweets go?"

With regard to these, Mr. W. J. Barker, addressing the London and Suburban Traders' Federation recently, said that "so-called alien alligators"—people not legitimately in the trade—were buying up huge quantities and selling them at exorbitant prices to retailers, who, to recoup themselves, had to charge two or three times what they were worth. Manufacturers and wholesalers were to blame for selling to those people instead of to shops. Most of the sweets were going to provincial towns where wages were high.

Surely it should not be beyond the power of the Manufacturing Confectioners' Alliance to publish a list of recognised traders in an effort to stamp out undesirable practices along the same lines as those adopted by the Publishers' Association, which issues a list of its advertising agents?



General view of a salmon cannery on the Skeena River.
(Courtesy Provincial Fisheries Department, Victoria, B.C.)

THE SALMON

Part II.

THE SALMON CANNING INDUSTRY

ELLIOT B. DEWBERRY, M.R.I.P.H., M.R.San.I.

HISTORY relates that in 1854 the first canning of salmon on the Pacific coast was carried out by Messrs. Hapgood, Hume and Co. in a large scow on the Sacramento River at Washington, Yolo, Co. California.

In 1870 a cannery was erected on the Fraser River in British Columbia by Messrs. Alexander Loggie and Co. This was located at Annieville, just below New Westminster. It may be of interest to mention that it was probably the high-quality canned Sockeye salmon from the Fraser River (which is the largest river in British Columbia) that popularised canned salmon throughout the world.

At this period all canning operations were accomplished by hand. As the work increased it became necessary to install a small amount of machinery, but hand labour was still employed for cutting and cleaning the salmon.

In 1872 George Hume began to employ Chinese labour in the industry.

As the demand for canned salmon increased more canneries were built along the coast from California, through Oregan, Washington and Puget Sound, and in 1878 the North Pacific Trading and Packing Company started a cannery in Alaska; others soon followed, extending north into the Bering Sea.

At first red salmon only was canned, but later, owing to the continued demand for the new food, other varieties were introduced, and finally all the five species of salmon were put on the market.

Rapid Progress and New Methods

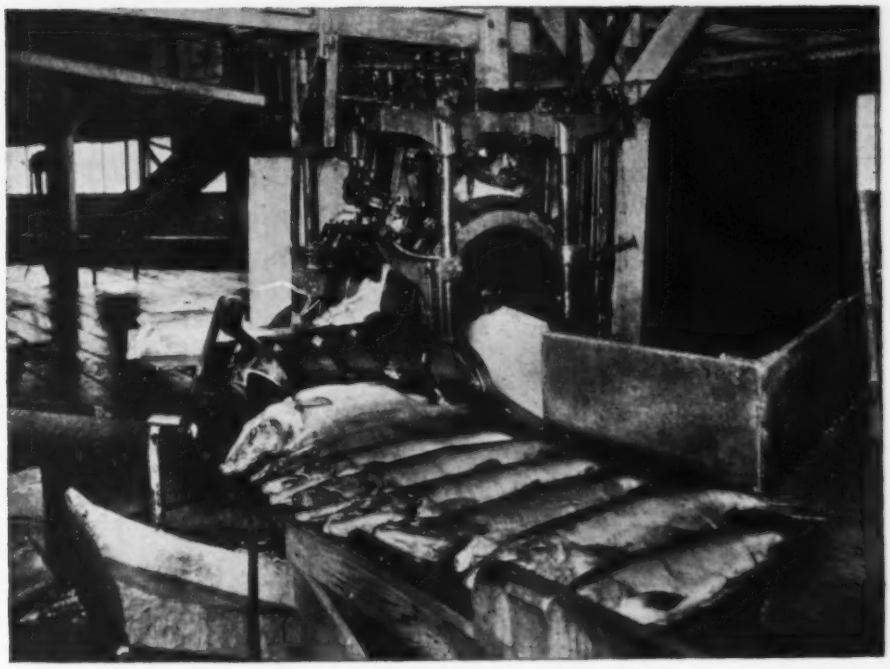
As time went on the canned salmon industry made rapid strides, with consequent improvements in all its branches. New fishing and trapping methods were introduced. Transport from the fishing-grounds was speeded up and better facilities afforded for unloading the fish at the cannery.

As a result of continued research and invention, hand labour in the large canneries gradually gave way to machinery for cutting, sliming and cleaning the fish, filling the cans, putting the tops on and washing them. There are to-day many manufacturing establishments which devote all, or the greater part of, their time supplying machinery to the salmon-canning industry.

In the early years of canning a pack of 150 to 200 cases was considered a good day's work; to-day it is not uncommon for an up-to-date factory to turn out from 2,500 to 5,000 cases a day and even larger numbers.

Unloading salmon at a British Columbia Salmon Cannery.

(Courtesy Provincial Fisheries Department, Victoria, B.C.)



Iron Chink,
Skeena River, B.C.

(Courtesy Canadian Government Motion Picture Bureau.)

At the present time Pacific canned salmon enters into the economic life of the civilised world. Great Britain and Canada are among the chief consumers of the product, although Belgium, the Netherlands and Greece take certain quantities. There is, however, hardly a country which does not import some.

The following table gives the details of packing from 1934-1938 :

WORLD CANNED SALMON PACK, 1934-1938

Year.	Red or Sockeye.	Pink.	Chum or Keta.	Medium Red Coho or Silverside.	King or Chinook.	Grand Total.
1934	4.459.399	5.613.564	1.605.351	676.632	356.778	12.718.684
1935	1.674.685	6.105.134	1.442.658	706.844	292.251	10.225.827
1936	3.862.110	6.567.409	2.092.908	844.303	327.064	13.699.979
1937	3.496.619	5.831.685	1.238.181	464.025	388.661	11.419.171
1938	4.200.811	4.733.997	1.382.568	712.264	237.506	11.267.146

Canneries are usually situated as near as possible to the source of the species of salmon to be used for canning. This ensures supplies of fresh fish and economies in transport. The comparatively short season makes it necessary to provide a speedy and adequate system of collection and transportation from the fishing-grounds to the factory.

Transporting Salmon to Cannery

Motor-boats with roomy holds, termed " packers ", sometimes having scows in tow, together with other suitable transport, are anchored near the fishing-grounds. These boats are loaded by the fishermen with the salmon taken from the traps, purse seines, gill nets, etc. A tallyman on board keeps a record of the number of fish he receives and furnishes the fishermen with receipts. Men fishing near the cannery are able to deliver their catches alongside.

In hot weather, or where the fishing-grounds are some distance from the cannery, crushed ice is sometimes carried by the packers and the launches in which salmon are placed to ensure freshness. Ice was first used for this purpose about the year 1785.

On arrival at the cannery the fish are unloaded on to elevators of the endless chain-bucket type. The lower end of an elevator extends a short distance above the top of the wharf to the water's edge and can be raised or lowered according to the state of the tide. At the top of the elevator are shoots which deliver the fish to the required situations.

Methods of Unloading

Various methods of unloading are in use. One is for men using forks or " peughs " (pews) to pitch the fish from the boats or holds on to the elevator, the fish being peughed through the head or tail. A second method is to sluice the salmon from the scows on to the elevators by means of a hose. Yet a third method is to use an " unloading scow " which is divided into compartments fitted with doors. When a scow is alongside a chute is placed between the door of a compartment and the elevator, which has a wide-mouth hopper at the lower end. The door is opened, and the salmon slide by gravity into a hopper—movement of fish being facilitated by using a hose—then up the elevator and down a chute to the butcher-room floor. Unloading by this method is accomplished in a short time, labour is economised, and the fish are not bruised or peugh-marked.

Grading

In up-to-date canneries the salmon pass from elevator on to a sorting belt, where they are counted and graded by species and locality of capture; and then down chutes to a series of " water-tight " bins sloping to one point.

Salmon which have remained in the scows from 20 to 24 hours are dealt with as soon as possible. Usually a period of time is allowed to elapse to enable the fish to shrink, otherwise, when packed, much juice is formed and lightweight cans may result. Certain species of salmon spoil more quickly than others.

Butcher-room floors are so constructed that waste materials will not find lodgment and accumulate. After each batch of fish is dealt with the floors and bins are cleansed and sometimes salt is scattered over them in preparation for the next consignment.

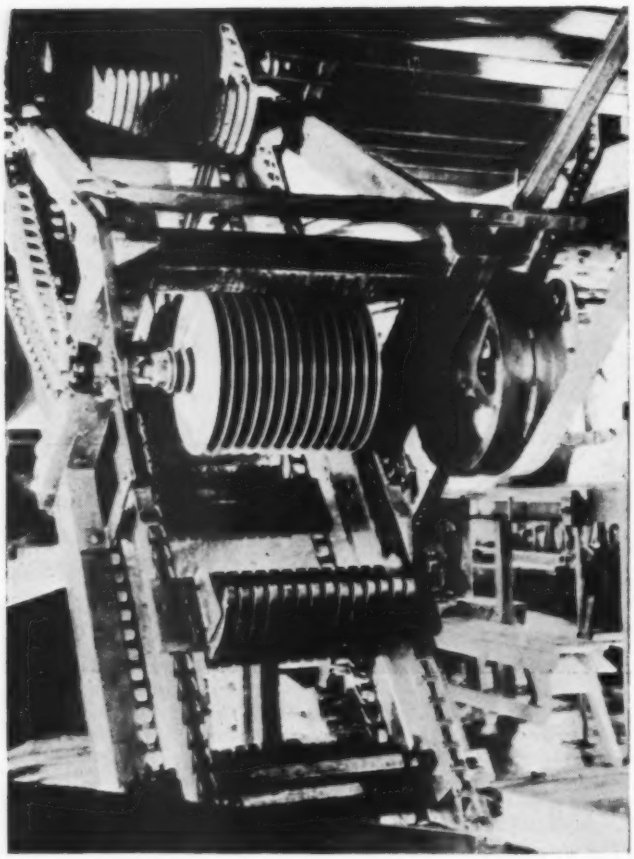
Canning

Formerly all salmon-canning operations were carried out by hand labour (mostly Chinese), but these conditions, except in small factories, have largely disappeared.

In canneries where the salmon are still slimed, cleansed and dressed by hand the heads, tails and fins are removed on the cutting tables and the entrails disposed of as described later. The dressed fish are then transferred to washing tanks, where they are scraped, cleansed and afterwards removed to bins on either side of the cutting machine. *En passant*, it might be mentioned that all large Chinook or King salmon are dressed by hand.

Modern factories now have ingenious machinery for dressing salmon, which operates with celerity, efficiency and economy. The plant, known as the " Iron Chink ", was first introduced at Fairhaven, Washington, B.C., in 1903 and is capable of dealing with 3,600 fish per hour.

The first operation is to remove the head, after which the body—tail foremost, belly uppermost—is automatically fed to the machine which grips the fish, adjusting itself to the various sizes. A series of knives then cuts off the tail and fins, slits open the body, and a revolving brush sweeps out the viscera. The offal falls to the bottom of the plant and then passes down a chute into a scow moored under the cannery. The scow is towed either to a fish reduction plant or the offal is discharged into the sea.



Interior of Salmon Cannery, B.C. "The Knives."
(Courtesy Agent-General for British Columbia.)

By-products

At the reduction plant, where conditions are favourable, the heads and entrails are cooked, pressed, the oil separated and the residue dried, giving a valuable fish meal for stock and poultry or for fertiliser. The oil is utilised for medicinal purposes, soap and paints.

The roe of certain species is manufactured into "salmon caviar", and from the milts of the males a "protamine" is obtained which is used in connection with insulin in the treatment of diabetes.

The eviscerated salmon, on leaving the iron chink, are conveyed to the sliming tables, where they are scaled, trimmed and washed in running water. After being inspected they are removed by a belt conveyor or wheeled in hand trucks with high sides to the cutting machine.

Cutting Machine

This plant consists of a wooden carrier with ledges or buckets operating on a chain. The buckets are wide enough to hold a salmon and are slotted in cross-section through the ledges and outer casing to receive the gang knives. The carrier and knives operate independently on individual shafts. As the buckets come into a horizontal position a workman places a fish on each, and they are then carried to the revolving knives, cut transversely into can-sized sections and afterwards slide down a chute to the filling machine. The rotary cutter shunts the tail portions to one side, and these are deposited into baskets. The tail portions contain less meat and are usually canned separately as a cheap grade of salmon.

In some canneries the gang knives are worked by hand and are mounted on an axle having a lever at one end. When this is raised the ends of the knives are thrown up and back. The fish is then placed under the knives, the lever pulled forward, causing the salmon to be cut into can-sized pieces.

Filling the Cans

Automatic filling machines have replaced to a large extent hand packing, except in the case of oval, flat or odd-size cans.

In the hand method the fillers (usually women) stand on each side of a long table having a trough down the centre, which contains sections of salmon. Large sections are placed in the cans, and then smaller pieces to occupy the vacant spaces.

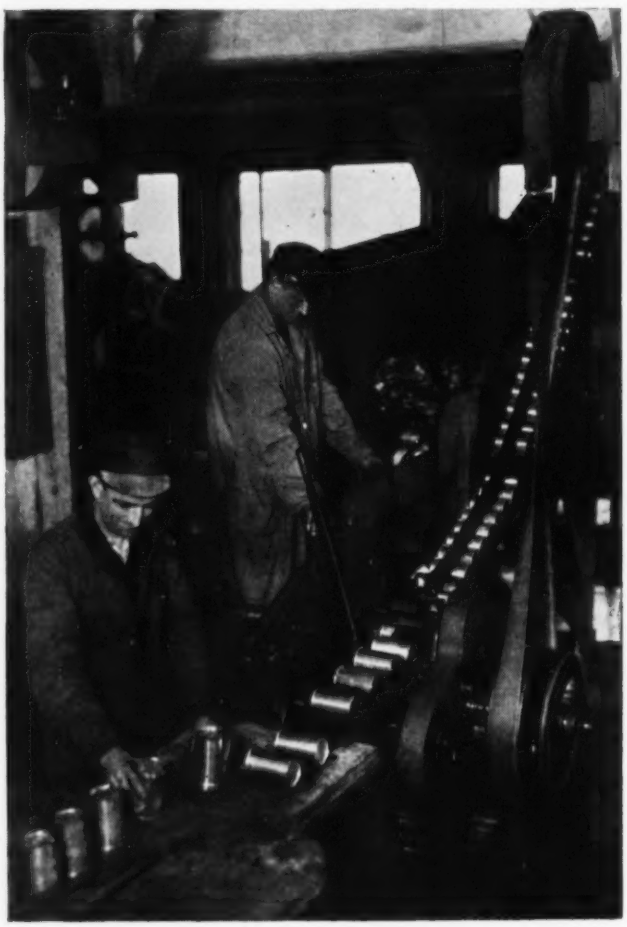
The automatic filling machine works at a speed of 60 to 80 cans a minute, but in some canneries this rate is accelerated to 120.

The empty cans are fed to the machine down a chute from the floor above, and as each enters it automatically receives $\frac{1}{4}$ to $\frac{3}{8}$ oz. of common salt. Simultaneously the divided sections of salmon pass down another chute into the mouth of a special apparatus (like a coffee mill) and are forced into a receptacle through which passes a cylindrical plunger or filler. The empty can is caught by a hook and held in position opposite the plunger, which is then thrust forward, forcing the required amount of salmon into the can.

The next operation deposits the can on to a table, where it is righted by a workman and pushed on to an endless belt connected with a weighing machine. Cans of correct weight pass through the machine, but if underweight are shunted to one side, where a worker adds the required amount of salmon. Usually the cans are overweight, being about $\frac{1}{2}$ oz. more than is stated on the label. Inspection, trimming, etc., are also carried out at this stage.

Clinching and Exhausting

The can now passes to the clincher, where the top is loosely attached to the body. This allows air to escape, but prevents direct access of steam and water of condensation, which might bleach the contents when in the exhaust box. In this latter apparatus the cans are maintained at a temperature of 206° to 212° F. for 5 to 15 minutes, according to size and shape. The heat causes the greater part of the air to be expelled and reduces strain on the sealed cans in subsequent processing; also it checks the growth of micro-organisms.



An automatic one-pound can filling machine, Vancouver, B.C., Cannery.
(Courtesy Canadian Government Motion Picture Bureau.)

There are many types of steamers, and the following is a description of one: The exhaust box is about 30 ft. in length, in which endless chain belts run side by side. Under and over each belt are steam coils, and under each of the lower coils perforated pipes, through which jets of live steam play upon them. Cans pass along on the first belt and are then transferred to the second belt, on which they return to the entrance of the box, whence they pass to the third belt, continuing on this to the end. Finally, they pass out to the "double seamer", which fastens on the cover with a double seam or crimp, making the can airtight.

Vacuum-closing Machine

This machine, combining exhausting and sealing, is now in use in modern canneries and is taking the place of the exhaust box. The cans are admitted through air ports to chambers from which most of the air is pumped. The tops of the cans are tightly rolled on at the same operation.

The plant requires less floor space, is economical, has greater speed of operation and is said to deal with 130 cans per minute.

The sealed cans are now subjected to jets of water under pressure in a washer, afterwards rolling down an incline to the coolers. These are large iron trays on which the cans are arranged. The trays are placed 6, 10 or 12 deep on trucks or cars, which are then run into cylindrical iron retorts for processing.

Processing

Each retort holds from 3 to 5 cars, so that it is possible to process about 4,300 cans at one time. The standard process is a period of 90 minutes at 10-lb. steam pressure at 240° F. for 1-lb. cans, and 75 to 80 minutes for ½-lb. cans.

The processing time varies to some extent with the species of salmon, size of can, method of obtaining a vacuum, and weather conditions. For instance, in Alaska 1-lb. tall Reds, Cohos, Chums and Pinks are usually processed from 90 to 120 minutes at 12 to 18 lb. pressure at 242° to 248° F., and 1-lb. flats and ½-lb. cans from 80 to 110 minutes. King salmon, owing to the large bones, is processed 10 to 20 minutes longer than other species.

Modern retorts are equipped with automatic controls, which guard against faulty operations as to temperature and time of processing.

After the air has been exhausted from the retort, 5 minutes is required to bring it up to standard temperature and pressure. At the end of the process another 5 minutes is allowed to bring down retort to atmospheric pressure before the door is opened. If a vacuum-closing machine has previously been used instead of the exhaust box, another 10 minutes is added to processing time because the cans enter the retort at a lower initial temperature.

On leaving the retort the trays are lowered into a tank containing an alkaline detergent which removes any grease or dirt. Travelling through on an endless belt, they pass to a second tank, where the cans are scrubbed and rinsed in hot water. The trays are afterwards wheeled to a cooling-room, where a stream of cold water is played on to the cans to stop the heat from continuing to cook the contents.

Inspection and testing are carried out at various stages during the whole process.

Machinery for lacquering cans was introduced in 1901 and used in several canneries. In nearly all British Columbia plants lacquering is still carried out. Of late years some of the large factories have discontinued lacquering the sides of the cans, relying on the label to protect this part from rust. Cans with enamelled ends are now supplied by manufacturers.

The finished cans are packed in wooden cases and warehoused. When shipment is to be made the cans are removed and labelled. In some canneries this is accomplished by automatic machinery, but labelling is usually carried out by hand. Sometimes the label is lithographed directly on the can, which is afterwards transparently lacquered.

Fancy brands of salmon are wrapped in coloured tissue before a label is attached. A case of salmon generally contains 48 1-lb. cans or their equivalent—*i.e.*, 24 2-lb. or 96 ½-lb. cans. Some canneries pack 48 ½-lb. cans in a case.

(To be continued)

Truck load of cooked salmon leaving retort one hour and forty minutes after cooking.

(Courtesy Canadian Government Motion Picture Bureau.)

SUGAR FROM WOOD

Details have been published of the large plant established at Rheinau, where some 6,000 to 8,000 tons of pure carbohydrates are recovered from wood annually, following the unsuccessful Prodor process operated at Geneva.

A short detail of the nature of the former process is as follows: The wood selected may be from almost any species, and may contain anything from 20 to 40 per cent. moisture.

After cutting the wood to small size in shredding mills, it is dried by waste heat until almost free from moisture, and then passed into diffusers, after moistening with by-product solution coming from the final diffusers used.

This solution consists of hydrochloric acid containing partly extracted sugar, and after the reaction in the diffuser has proceeded for a predetermined time it is passed through a succession of diffusers, numbering eight in all. In the final diffuser almost concentrated hydrochloric acid is used, and it is the product from this which is passed back to the first plant, as it still retains much of its acid content. The solution from the first diffuser is drawn off to a distillation plant, and is claimed to contain 35 per cent. of sugar. As to the surplus hydrochloric acid, which by the system of using different diffusers consumes the least possible acid, about 40 per cent. is eventually recuperated by absorption in a washing process. The reclamation of the acid is a very important item and specially designed plant is called for. The sugar liquors are evaporated until a syrup containing 55 to 65 per cent. of sugar is obtained. This syrup is then dried by injecting it through a nozzle together with compressed hot air, whereby solid sugar is formed, which drops to the bottom of a cyclone collector, where it is packed for the market.

While there may be many technical difficulties connected with the successful manipulation of the process, it may be that in this country where there is at least a fair abundance of pinewood, which appears to be most suitable for the purpose, the extraction of sugar from it may yet be worthy of consideration.

FOOD LEGISLATION

IN PEACE AND WAR

Part I.

THOMAS McLACHLAN, F.I.C.

IT IS probably no exaggeration to say that in few civilised countries in the world is food legislation in such a hopeless tangle as in the United Kingdom in peace-time, and with the introduction of innumerable Statutory Rules and Orders by the Ministry of Food in war-time the situation is likely to go from bad to worse.

Food and Drugs Act, 1938

In 1938 a consolidating Food and Drugs Act was passed, which came into force on the first of October, 1939, after the commencement of the war. Admittedly this was a consolidating Act, which repealed or partially repealed forty-one previous Acts of Parliament and which therefore meant the bringing together of various pieces of legislation affecting the sale and control of food and drugs. Before the Act came into force the war had broken out and the Ministry of Food had been formed, with the consequent introduction of innumerable Emergency Orders made independently of the Minister of Health, although many of these directly affect the composition of many foods. Whether it would not have been wise to have postponed the date of enforcement of the new Act in view of the war is a matter which could be debated *ad nauseam*, but as the Ministry of Food had already been established at the date of commencement it would have been preferable that any Order affecting the composition of food should have been passed from the Food Ministry to the Minister of Health, or that a supplementary Act of Parliament should have been passed by which the Minister of Food should have powers to make Orders affecting the composition of food during the state of emergency and that such Orders should take effect under the Food and Drugs Act, 1938. Nothing so simple was arranged in order that duplication of control and evasion of responsibility be avoided.

Agricultural Produce (Grading and Marketing) Acts, 1928 and 1931

Other Acts of Parliament which assist in the control of food are the Agricultural Produce (Grading and Marketing) Acts, 1928 and 1931. These Acts are intended primarily to raise the quality of articles made or produced in this country and to which a hallmark can be assigned. The idea is very laudable, but it is questionable whether they quite achieve the object for which they were intended. Many of the standards required by the Agricultural Produce (Grading and Marketing) Acts are simply those which many reasonable people think should be required of any products sold under distinctive names, whether these be produced at home or imported. Possibly one or two of the Orders made under these Acts may be a trifle stringent, but on the principle that a rose by any other name would smell as sweet, it is difficult to understand why a new name should not be found for an inferior product rather than that some qualifying adjective should have to be applied to an article to show that its quality is somewhere approaching the standard that the ordinary housewife would expect to reach if she were making the article at home.

Food Standards

In his last Annual Report, Mr. Bullock, the Public Analyst for Leicester, draws attention to the fact that the Minister of Health possesses powers under the Food and Drugs Act to provide standards for foods, but that he has failed to do so. FOOD MANUFACTURE has several times advocated the setting up of committees representative of all parties to advise the Minister with regard to food standards, and it has been suggested that disputes with regard to the necessary composition of food should be referred to some such committee for arbitration rather than that the parties should have to proceed to court and ask a lay bench of magistrates or a stipendiary to fix a standard, which the court sitting next door may refuse to recognise. Once such a standard had been fixed and promulgated by the Minister of Health as a Statutory Order under the Food and Drugs Act it would then be the duty of the courts to enforce it.

Ministry of Food Orders

As a result of circumstances the Ministry of Food is now turning out Orders, which have to be kept, and while doubtless it is necessary for these Orders to be made, as stated above, in the author's opinion it would have been better for them to have been promulgated by the Minister of Health, who has a department already built up in peace-time capable of considering the composition of food. In issuing such Orders it should further be specifically mentioned that they are war-time standards only applicable during the present war and are not to be taken as forming standards for foods in general, unless it would be against public policy to admit that there has been any depreciation in quality, though all may be aware of the fact.

If we become accustomed to meat roll containing only 30 per cent. of meat in war-time, it will not be difficult for manufacturers who wish to keep down the quality of their goods after the war to use this as a standard. In the last war, Emergency Orders were made regarding the maximum amount of free fatty acids in dripping and various oils, and it has been difficult to get away entirely from these after twenty years; unless care is taken the same thing will occur after the present conflict is over. It may be mentioned that the free fatty acid content of dripping has again been legalised at 2 per cent.

Agreements between Societies and Manufacturers

In order to overcome the difficulty arising from the lack of leadership by the Minister of Health, several agreements have been reached by the Council of the Society of Public Analysts and Other Analytical Chemists with manufacturers' federations, but it is doubtful whether such arrangements are really in the public interest. It may be argued that similar agreements have been made between the Society of Medical Officers of Health and manufacturers, but a slight difference does exist in this case in that the society is composed almost solely of Medical Officers of Health; even so, it is surely wiser to have a proper and binding legal decision made by a properly constituted authority rather than by interested parties. One weakness of such agreements is that they may not necessarily be upheld by the courts, and in one instance, in November, 1937, a defendant, who had been convicted in a Court of First Instance, appealed in Ireland, and the decision was reversed because the learned judge held that the Local Government Department should adopt the standards laid down in such agreements if they wished to support them.

Names for Foods

While it has been suggested above that names should not be degraded by being applied to articles inferior to those for which they have long been known, it should be clearly understood that there is no intention to cast the slightest reflection on many articles of food which come into the market at the present time in so far as their food value or nutritional qualities are concerned. The only objection raised is to the use of long-recognised descriptions for preparations other than those to which they are usually ascribed. One well-known firm of caterers has frequently introduced new lines to the market and usually adopts the practice of giving the article a proprietary name. Such descriptions can imply especial qualities and from special descriptions a particular type of product or service is expected. The name "Nippy" applied to waitresses suggests quick service, but to confine oneself rather to names for foods, those applied to meat extracts come to mind as examples. No attempt has been made to employ the term "Meat Extract" for preparations offered to the public; one asks for Bovril, Oxo, Beefex, Lemco, or some other article. Yeast extract is likewise known not by its own name, but as Yeastrel, Marmite, etc. Surely it is infinitely preferable that manufacturers of other lines should proceed on this basis rather than attempt to call a flavoured, sweetened starch mixture "lemon curd", when this product was made originally from entirely different ingredients.

Divulging Composition of Foods

Some years ago great consternation was caused among manufacturers exporting to countries such as Australia, when that country introduced its new food laws, which required the composition of infant foods and certain other foods to be disclosed. In order to export foods and other products to certain countries —Greece and some of the American States, for example—a declaration of composition must be given to the Customs authorities of the countries concerned, and it has always been the aim of manufacturers to disclose as little information as possible compatible with obtaining an entry for their products into the country concerned. This is one of those subjects on which it may truthfully be remarked that there is a lot to be said on both sides. How many people would rush to buy a non-alcoholic wine labelled to the effect that it contained certain percentages of sugar and so many parts per million of sulphur dioxide, named dyes and synthetic flavouring chemicals?

When years have been expended in advertising and marketing a liqueur, a bun flour, or a custard powder it may be legitimately asked whether it would be fair to the manufacturer to be forced to disclose his secret formula. Actually it is often impossible; even the manufacturer himself does not know the composition of many of the ingredients because he probably buys his colours and flavours under trade names.

Medicated Products

For general foods it is doubtful whether much could be gained by making the wholesaler declare the composition of his goods, but for medicinal preparations, invalid foods, etc., the situation is entirely different. Many medicated wines are sold as " Triple-strength Quinine Wine "; sweets are sold as paregoric, linseed, liquorice and chlorodyne, etc., when they do not contain the active alkaloidal ingredients which are responsible for the names by which they are known. If a baby food has been prepared from things other than milk there would appear to be no harm in fully disclosing its composition; it is possible that it may have properties especially suitable for certain infants. In the same manner, the author is entirely against the sale of colours, flavourings, etc., to the actual food compounder under fancy names. The manufacturer should know what he is putting into a food and be responsible for it; the law of warranty is far too wide in its present form.

False Claims in Advertisements

Many manufacturers do not appear to realise that under the present Food and Drugs Act it is illegal to make any false claims in advertisements, and several prosecutions have already been brought under this section of the Act. Exception has been taken to advertisements suggesting that a quantity of creamy milk may be obtained by using certain milk powders, which on analysis were found to be prepared from skim milk. In the view of the author, it is now illegal to employ an advertisement which suggests that there is no necessity to worry about a fruit shortage if one takes certain fruit salts, and he is glad that this particular example seems to have disappeared.

It would be possible to write at great length on the matter of food legislation, but it may be preferable to deal with certain types of food on the market and examine whether they demand or do not demand special legislation. The examples quoted are by no means exhaustive and have been selected as being typical.

Cheese

Orders made under the Agricultural Produce (Marking and Grading) Acts require Caerphilly, Cheddar, Cheshire, and Lancashire cheeses to contain not less than 45 per cent. of butter-fat in the moisture-free substance. Most people will agree that not only is this a fair standard for cheeses sold under these descriptions, but that any cheese not labelled in such a manner as to denote a higher or lower fat content should conform to this figure. Standards could be arranged for three-quarter-skim, half-skim, or skim-milk cheeses, and these should be labelled accordingly.

A few years ago it was thought that the cream was the all-important portion of milk, but now we are advised that we should drink skim milk—though it is impossible to obtain it in towns; there is therefore no reason why skim-milk cheeses should not be sold, providing the purchaser is aware of what he is buying. It is wholesome and nutritious, but if properly labelled the purchaser would be more likely to obtain an article conforming to the price paid for it. Dutch cheese, as sold, is usually a skim-milk cheese, but the housewife is not informed of the fact.

Under the Agricultural Products (Marking and Grading) Acts, cream cheese and double-cream cheese must conform to a standard of 55 and 70 per cent. of butter-fat. There is no reason why all cheeses sold by these descriptions should not meet these requirements. The Minister of Agriculture and Fisheries has recently issued an advisory leaflet in which he points out that in the absence of any legal standard for cream cheeses, it is usual in this country for single cream cheese to be made from cream containing from 25 to 30 per cent. of butter-fat and for double-cream cheese to be made from cream containing about 50 per cent. of butter-fat. There is no reason why imported articles should be inferior to these products, nor for the importer to be able to claim that he acted in good faith in passing them on to the consumer. Most countries have import laws which prohibit the importation of products inferior to the home-produced article. Our Food and Drugs Act allows the importer to be relieved of responsibility if he shows that he had good reason to believe the article to conform to any required standard, which is to the disadvantage of the home producer.

Processed Cheese

During the last few years many complaints have been made about the amount of water contained in processed cheese, and an agreement has now been reached between the Council of the Society of Public Analysts and the Food Manufacturers Federation that 42 per cent. of water will be permitted. In the author's opinion this quantity of water is excessive and should be reduced to not more than 40 per cent.

In a recent case a firm was prosecuted for selling a processed cheese as Gruyère cheese, and it was claimed that it was prepared from Gruyère cheese. Without knowing the details of this case it is impossible to express an opinion, but it is the author's view that if a particular variety of cheese is processed without any addition other than steam, it should be permissible to retain the name of the original cheese. To argue that if the cheese no longer contains holes it is no longer Gruyère cheese is weak and illogical, because it must be appreciated that holes can be produced in cheese as easily as in furniture, and that arguments such as the above employed in court merely invite processors to reduce the quantity of cheese supplied for the price asked.

In view of the fact that margarine cheeses must be labelled as margarine cheeses, it is remarkable that it does not appear to have been noticed that it is more immoral to sell a skimmed-milk cheese as cheese without any qualification than to sell cheese containing margarine fat as part of its fat content. Not that it is being suggested that the addition of margarine fat to cheese without declaration should be legalised, but it is surely absurd that this latter act is illegal while the other is quite permissible.

Cream

One of the most unfortunate Acts of Parliament from the standpoint of food administration was the Artificial Cream Act, 1929, carried forward into the Food and Drugs Act, 1938, as Section 27. The obvious title for this Act was the Reconstituted Cream Act or simply the Cream Act. The Act achieved very little. It defined cream as " that part of milk rich in fat which has been separated by skimming or otherwise ". This makes it difficult to tell the dividing line between milk and cream. As a result it has been a simple matter to employ terms such as " thick ", " double ", " rich ", " Devonshire ", " clotted ", etc., with little risk of contradiction, and there was some trouble when canned cream came on to the market to prevent the use of the term " thick " cream for a product which actually contained less than 20 per cent. of milk-fat but which had been thickened by homogenisation. Previous to the introduction of canned cream it was generally expected that cream should contain upwards of 36 per cent. of milk-fat, and in order to compete with the canned product, dairymen have had to introduce a thinner cream known by various names, such as " coffee ", " fruit " cream and so on. Now that it is illegal to sell cream or the legal artificial cream, manufacturers are placed in a quandary because they obviously feel that a product labelled " synthetic " cream would not sell, and they are adopting the ruse of names such as " Fream ". Somehow the word " artificial " has not the same sticky flavour in the mouth that " synthetic " possesses, and an effort should be made to alter the law in such a way that after the war is over the terms " reconstituted " and " artificial " can be more properly applied.

(*To be continued*)

SUBSTITUTES IN ICE CREAM

Seriously hit by the war, the ice cream industry has been obliged to have recourse to so many substitutes that it has itself become a substitute for the pre-war product. This article discusses the war-time problems of ice cream manufacturers.

L. J. HYNES

THERE IS a tendency in some quarters to insist that the sort of ice cream made nowadays is by no means a substitute, as it has generally been called, but an alternative. The ice cream manufacturer is having a difficult time, and he is well within his rights in making the best of a bad situation and in claiming for his war-time product all that can be claimed for it in the matter of food value and other qualities, but when all is said and done it still remains a fact that his ice cream is very definitely a substitute, to which he has been driven by sad necessity. If, after the war, he should choose to continue making essentially the same sort of ice cream, in addition to ice cream as it is generally understood to be—basically a dairy product—then, of course, the former will clearly be an alternative to the latter. But, equally clearly, it is not an alternative now, however nutritious it may be claimed to be. It is no more than a substitute, and should be frankly recognised as such.

Ice Cream—A Milk Product

If it be admitted that the essential constituents of normal ice cream are milk solids, then the palpable fact emerges that the very essence of ice cream has been destroyed by legislation; for, with the exception of the fat of such butter as is available, no milk solid, no matter in what form, is now permitted in ice cream, unless it be taken from existing stock. The milk solids are of two kinds, fat and non-fat. In making a substitute ice cream, therefore, the manufacturer has to replace these solids as well as he can. In lieu of milkfat (or butterfat) he has at his disposal unsalted margarine and various vegetable fats and compounds, for all of which a permit to purchase has to be obtained. In lieu of the non-fat solids there are available certain substances as "fillers"—for the most part starches, such as wheat flour and, to a limited extent, cornflour, which is scarce. Other substances, useful as supplementary fillers, are such as soya bean flour and dried egg-yolk or whole egg, but of both these products there is a serious shortage and many would-be users are finding it impossible to obtain either.

Sugar, of which a certain minimum is absolutely necessary for ice-cream of reasonably good quality—the question is not entirely one of sweetnsss but of total solids in the mix—is still available, but remains rationed at 40 per cent. of pre-war usage. Neither glucose syrup nor dextrose (dry) in any form is obtainable. There is some honey, but not a great deal, so that for the most part ice cream manufacturers wishing to supplement the sugar content of their mixes have small choice but to fall back on a saccharin sweetener.

Abuse of Sugar Ration

Some two or three months ago the Ministry of Food complained that, as evidence in its possession proved, some ice cream makers were using for other purposes sugar allocated to them for ice cream. Evidently, if they did not require it for ice cream, either because they did not propose to manufacture or for any other reason, they were not entitled to an allocation of a food commodity very limited in supply, and the Ministry issued a warning that if that sort of thing continued it might lead to cancellation of a manufacturer's entire ration of sugar, and possibly to prosecution.

Similarly, the Minister of Food does not favour the use of the greater part of a sugar ration, granted for ice cream manufacture, in water ices. His attitude is sound. In these difficult times we need all the available sugar for ordinary domestic purposes or for the manufacture of nutritious foods, and a water ice, apart from its content of sugar, has no nutritive value. Its production, therefore, to any considerable extent cannot be justified. Ice cream, on the other hand, has considerable food value, and the sugar allocated for use in its manufacture is serving a definitely useful purpose by making possible the production of a nutritious article of food. Hence such sugar should be used for that purpose.

Substitute for Butterfat

Pre-war users of butter or butter substitutes have been granted an allocation of fats for ice cream manufacture. On the other hand, ice cream makers who did not use these materials before the war—for example, the large number of small traders who made ice cream from fresh milk, with or without addition of dairy cream—are not entitled to an allocation of substitute fats. This being so, they have to make the best sort of ice cream they can without fat of any kind, unless they can manage to procure some synthetic cream, and as neither liquid milk nor milk powder (whole or skim) nor condensed milk or similar product is permitted, they are badly handicapped. It was considered possible that some concession might be made to traders in this position, but whatever hopes they may have entertained of such concession being granted have so far not been realised. No concession has yet been made, and the fact has created a good deal of dissatisfaction among the smaller manufacturers who, almost without exception, were the only ones to suffer. Nearly all the larger firms made the reconstituted type of ice cream (from butter or a substitute, etc.) before the war, and were therefore entitled to an allocation of fats.

Vegetable Oils

Among the substitute fats now being used satisfactorily are such vegetable oils as coconut, ground nut and palm kernel, all refined and deodorised, and in some cases hardened, and various compounded "vegetable butters" or butter substitutes, as they are sometimes called, containing practically 100 per cent. of fat. Unsalted margarine (fat content 84 per cent., as in good butter) is also used, and is eminently satisfactory.

Coconut oil, which resembles butterfat fairly closely, is obtained by pressure from coconut meat. It is a white, semi-solid fat, like lard, and becomes liquid at 20° to 25° C. (68° to 77° F.). The refined oil has good keeping qualities and a pleasant flavour, and is compounded in the making of "vege table butters". Ground nut (Arachis) oil in its natural state also possesses an agreeable taste and odour, but is obtainable practically tasteless and odourless. It is largely used in the manufacture of compounds like oleomargarine.

Any such oil or fat, or a mixture of several oils, may be used as a substitute for butterfat in ice cream.

Whale Oil

Whale oil was suggested early in the war as providing another more or less satisfactory substitute. This oil is largely used, of course, in the production of normal margarine, and is highly valuable from a nutritive standpoint, but it is to be doubted whether, used alone as a substitute for butterfat in ice cream, it would be satisfactory, or at any rate as satisfactory as a suitable vegetable fat or a mixture. As far as the writer is aware no considerable manufacturer has ever adopted whale oil alone for use in ice cream, and at least one well-known firm of purveyors of fats, etc., has positively stated that it cannot be considered satisfactory by itself.

Unsalted margarine has been found to replace butterfat very successfully, though naturally less economically than the vegetable fats and "100 per cent." mixtures since, of course, it is considerably more costly than the latter. In the manufacture of margarine the vegetable oils already mentioned are used, together with other vegetable oils like that derived from the soya bean, and animal fats of high quality.

The various oils and fats must, of course, be refined, for

although the natural taste and odour may be agreeable enough, as in the case of coconut and ground-nut oils, for example, such flavours must not be present in ice cream. Similarly they must be completely eliminated from the oils used in the production of margarine, as they are not desired in connection with any of the purposes for which margarine is used. The crude oils are therefore subjected to a very thorough process of refining which removes all characteristic flavours and odours so that the final products are entirely tasteless and odourless.

In the manufacture of margarine, which to-day has reached a very high standard of excellence, the various oils and fats are not the only substances used. The liquid basis is fresh milk. This is pasteurised and conditioned to develop the butter aroma, after which the refined oils and fats are blended and churned with the milk, the emulsion then passing to cooling drums for solidification. The product is subsequently plasticised. The ice cream manufacturer is not, of course, interested in the physical resemblance of margarine to butter, and to that extent margarine has, for him, no advantage over a good vegetable oil or " 100 per cent. fat " (mixture). He may, however, prefer it on the score of flavour. Good results, and at a moderate cost, may be obtained by combining margarine and another oil or fat (or a mixture) in suitable proportions.

In using any of these butterfat substitutes in ice cream mix, homogenisation or emulsification is obviously necessary. A fat content of from 8 to 10 or 12 per cent. is desirable. Perhaps most experienced users of these substitutes would agree that, on the whole, a desirable maximum where a straight oil or one of the 100 per cent. mixtures is used is about 10 per cent. When a fair proportion of margarine is used the fat content might well be 12 per cent. For the cheaper ice creams a fat content of from 3 or 4 to 6 per cent. is quite commonly preferred. Synthetic cream, used sometimes by the smaller traders, requires no emulsification, the fat being already in an emulsified state.

Fillers

So much for the butterfat substitutes. We shall now consider the various fillers which ice cream manufacturers are compelled to use for the purpose of replacing, as far as replacement is possible, the milk-solids-not-fat, and so obtaining satisfactory body and texture and general palatability.

The most obvious filler which suggested itself was cornstarch. In normal times this substance was used to a considerable extent by the smaller ice cream makers in the manufacture of the custard type of product, for which it was very suitable. Almost immediately, however, supplies of cornstarch became comparatively scarce. It was not long before it was rationed to trade users, and it has since remained so. As far as ice cream manufacturers were concerned, therefore, the position was that although they might be able to obtain some cornstarch they could not hope to obtain much, and that being so, they had to look elsewhere for a suitable filler.

Wheat flour was tried. On the whole, it proved fairly satisfactory, if not ideal, and it has been generally adopted. In fact, there is scarcely an ice cream made to-day that does not contain a proportion of this filler.

The Value of Starches

For ice cream purposes the value of all starches, as such, lies in their capacity to swell when heated to a sufficiently high temperature, absorbing large quantities of water. There are, however, one or two drawbacks to their use. Ice cream stabilised by starch has an initial smoothness of texture of a more or less pasty kind, according to the amount used, but this characteristic smoothness is not long retained. It rapidly gives place, usually in a few hours, to a typically coarse condition, especially when the ice cream is stored at the customary low temperatures. It was for that very reason that the experienced makers of so-called " Italian ice cream " (a starch-stabilised product which usually contained eggs) made a practice of holding their ice cream for no longer than a day. If any remained unsold it was melted down the next day and re-frozen.

Again, all starches have the disadvantage, from the standpoint of purity of the essential dairy-product flavour, of imparting their characteristic taste. The disadvantage on that score is of less consequence in some cases than in others. The flavour of cornstarch, for instance, is liked by many people, and these would consider it rather an advantage than a disadvantage in ice cream. However, ice cream manufacturers were not, and are not, in a position to choose on the question of the use of some sort of starch. They had to use it, and the problem was to get the best out of the most suitable starch available while endeavouring to reduce whatever disadvantages it might possess to a minimum.

The Use of Wheat Flour

To return now to wheat flour. The average carbohydrate content may be put at about 75 per cent., mostly starch, with small proportions of sugar, dextrin and fibre. The important proteins constitute about 12 per cent., of which about 11 per cent. consists of the water-insoluble gluten, which is primarily composed of two proteins—glutenin and gliadin. The former is insoluble and the latter soluble in dilute alcohol. Gliadin has also some measure of solubility in distilled water, but in ordinary water containing traces of metallic salts is virtually insoluble. Gluten is a rubbery, sticky substance, highly important in bread-making, the glutenin contributing adhesiveness and the gliadin cohesiveness to the dough.

The extent to which the wheaten taste will be evident in ice cream will naturally depend on the amount of flour used. The taste, though not exactly unpleasant, is scarcely desirable in ice cream. With contents like 2 or 2·5 per cent. (totally inadequate, of course, in war-time ice cream, unless some other starch is used in addition to the wheat flour), the wheaten taste is comparatively slight, and in the circumstances may be considered negligible. With higher contents, on the other hand, it usually becomes pronounced, and it is necessary to cover up the flavour as far as possible by using vanilla or other flavouring in quantities appreciably greater than those usually employed.

Skim-Milk Powder

Bearing in mind that the object of the ice cream maker in using a filler is to replace the missing milk solids, thereby giving his product body, a satisfactory texture and general palatability, it is evident that he must aim at using as much as possible, while at the same time avoiding the defects of sogginess and pastiness which too high a proportion would produce. If, of course, he is in the fortunate position of being able to use a certain amount of skim-milk powder taken from existing stocks, he can keep down his starch content to about 4 or 5 per cent., using some suitable substance to complete the stabilisation. For example, his mix might be made to test, say, 10 per cent. of fat, 6 per cent. serum solids, 4 per cent. wheat flour, 0·15 per cent. sodium alginate, and 11 to 12 per cent. sugar, perhaps with a little saccharin to supplement, giving total solids of some 32 per cent. and producing a reasonably good ice cream. If, on the other hand, he has no milk powder on hand, then the proportion of starch must be much increased. About 7·5 or 8 per cent. may be considered the minimum for fairly good results, and not a few manufacturers are using more, especially when the fat content of their mixes is low or (as in the case of many of the smaller traders) *nil*.

A deglutenised wheat flour has been placed on the market, and this product is thought to be rather more satisfactory than ordinary flour. Somewhat more of it may be used without getting that extreme sticky pastiness which is apt to result from the use of large quantities of the normal flour.

Potato flour is not satisfactory. Besides imparting a flavour far from desirable it is unattractive in colour. Rice flour is very useful, and in combination with wheat flour and a little cornflour quite good results have been obtained with it. Unfortunately it is very scarce at the moment, and seems likely to remain so. Cornflour, as has been said, is very satisfactory. It may be used successfully with wheat flour in the proportions of 1 : 2, having regard to the shortage of cornflour.

Processing

Many of the smaller ice cream makers, especially those who have been accustomed all their lives to handling custard-type mixes, insist that prolonged boiling of a starch-stabilised mix is necessary for satisfactory results. The writer has known a case where a man held his mix at or close to boiling point for no less than two hours! He maintained that he obtained a richer mix through the evaporation of much of the water, apparently overlooking the fact that the same concentration could have been obtained by using less water in the first instance and at much less cost of fuel. This quite common view that prolonged boiling is necessary is a fallacy. If a starch-stabilised mix is brought to about 180° F. or so, and held at that for a short time, it will be sufficiently cooked, although, of course, no harm is done by carrying the temperature higher.

In processing mixes containing considerable percentages of wheat flour it is of distinct advantage to soak the flour over-

night in about three times its weight of cold water. The rest of the water of the mix can then be added and the whole heated, with constant agitation, to about 180° F. If some cornflour is used it can be pasted up with a little cold water taken from the mix quota and the paste added to the bulk of the mix when hot, to be cooked with it. Sugar, and a little salt—about 0·12 per cent. of the mix—may be added at any suitable temperature for ready dissolving.

Soya Bean Flour

The soya bean seed contains very little starch but a high percentage of fat and protein, the proportions of which vary with such conditions as the variety, the nature of the soil and the climate. The average fat content may be put roughly at about 18 per cent., that of protein at about 40 per cent. The soya bean has an unusually high mineral content and is rich in vitamins A and B. It has been justly called "the king of the legumes", and as a food is remarkably "complete". In the absence of milk, a mix containing soya bean would be the next best thing.

As was, of course, to be expected from the prevailing state of world chaos, the supply of soya bean products in this country has for some time been very limited—unfortunately so, as they would have been most welcome. However, there appear to be indications of a considerably increased supply becoming available in the near future. From an ice cream point of view soya bean flour or other suitable bean product, notably one marketed under a trade name and of proved excellence, is very useful as a highly nutritious filler. The natural flavour of the bean is bitter—quite distinctive—but it can be removed by chemical treatment.

Of dried egg-yolk and whole egg no notice need be taken here. Neither is a substitute material, egg-yolk having been a normal constituent of many pre-war mixes, while dried whole egg was seldom or never used. For a long time now it has been difficult to obtain either.

The present emergency has naturally produced various substitutes of a proprietary kind. Obviously one cannot attempt to generalise as to the merits of these. The writer has used one very good milk substitute, while, on the other hand, analysis of another substance of a different sort shows it to be virtually a tinted baking powder diluted with starch.

Sweeteners

To eke out the meagre sugar ration allotted to ice cream manufacturers a dry dextrose product, such as was quite extensively used before the war, would have been most useful. Unfortunately, it has for long been unavailable, and though it was replaced by another sweetener for some time supplies of the latter have now ceased; and in any case it had certain disadvantages, notably in the matter of flavour. Even so, it was useful to a limited extent while supplies lasted. Glucose syrup would not have been despised, though its sweetening power is relatively low and its utilisability in ice cream limited. But that, too, is not available, and the same is true, at any rate for all practical purposes, of invert sugar.

The supply of honey is far from abundant, but there is a little to be had. Ice cream manufacturers who can get any quantity will be fortunate. As a supplementary sweetener to sugar, honey is very useful. Its sweetening power may be put at about 70 per cent. of that of cane sugar or beet sugar. Some 8 or 9 per cent. is needed to impart a distinct honey flavour to ice cream, but as few manufacturers would be in a position to use it to that extent the question of its flavour effect—or, for that matter, its effect (as an invert sugar) on the freezing point of the mix—does not arise. About 4 per cent. of a suitable honey, with 9 per cent. or so of sugar, will give an ice cream which, judged by war-time standards, is sweet enough, and, as just mentioned, the effect in abnormally depressing the freezing point of the mix will be negligible.

Saccharin and saccharin preparations form a standby as supplementary sweeteners. Needless to say, they must be used only in very small proportions because of their high sweetening power, several hundred times that of sugar; but apart from that the use of relatively high proportions of saccharin sweeteners is undesirable because of the peculiarly unpleasant effect on flavour. The writer would not recommend the replacement of more than about 2 per cent. of the normal 12 to 14 per cent. sugar content of a mix by the equivalent amount of saccharin. Thus, if we give saccharin powder as ordinarily available a sweetening value of 500 to 550 times that of sugar, we might use, in a 100-lb. batch of mix, about 27 or 28 grains of saccharin, or roughly 1 dram.

MINISTRY OF FOOD

LATEST STATUTORY RULES AND ORDERS

No.	*Date.* 1941.	
		PRICE FIXATION ORDERS
644	May 7.	Amending the Home Produce Eggs (Maximum Prices) Order, 1941.
645	,, 7.	Amending the Rice (Maximum Prices) Order, 1941.
659	,, 10.	The New Potatoes (Maximum Prices) Order, 1941.
666	,, 12.	Amending the Butter (Maximum Prices) Order, 1941.
671	,, 14.	The Canned Sardines (Maximum Prices) Order, 1941.
675	,, 14.	The Tapioca and Sago (Maximum Prices) Order, 1941.
693	,, 16.	Amending the Canned Fruits (Maximum Prices) Order, 1941.
694	,, 16.	Amending the Feeding Stuffs (Maximum Prices) Order, 1941.
737	,, 28.	Direction, under the Control of Mills (Flour and Provender) No. 1 Order, 1939, and the Flour (Prices) Order.
739	,, 28.	Amending the Flour (Prices) Order.
746	,, 29.	Amending the Meat (Maximum Retail Prices) Order, 1940.
748	,, 29.	Amending the Oats (Control and Maximum Prices) Order, 1940.
816	June 9.	Prescribing Appointed Days for the purposes of the Soft Fruits (Maximum Prices) Order, 1941.
808	,, 7.	The Canned Meats Products (Control and Maximum Prices) Order, 1941.
814	,, 9.	The Fruit Pulp (Control and Maximum Prices) Order, 1941.
817	,, 9.	Amending the Soft Fruits (Maximum Prices) Order, 1941.
858	,, 17.	The Home Grown Tomatoes (Maximum Prices) Order, 1941.
859	,, 17.	The Tea (Current Prices) Order, 1941.
864	,, 18.	Amending the Bacon (Prices) Order, 1941.
866	,, 18.	Amending the Canned Vegetables (Maximum Prices) Order, 1941.
888	,, 20.	The Eggs (Control and Prices) Order, 1941.
889	,, 20.	The Eggs (Control and Prices) (Northern Ireland) Order, 1941.
891	,, 20.	General Licence, under the Syrup and Treacle (Maximum Prices) Order, 1941.
924	,, 27.	The Fish (Maximum Prices) Order, 1941.
927	,, 28.	The Eggs (Control and Prices) (Northern Ireland) (No. 2) Order, 1941.
		MILK AND MILK PRODUCTS.
657	May 9.	Amending the Use of Milk (Restriction) Order, 1941.
695	,, 17.	Amending the Cheese (Licensing and Control) Order, 1941.
745	,, 29.	Directions under the Condensed Milk (Distribution) Order, 1941.
928	June 28.	Amending the Directions, dated January 6, 1940, made under the Rationing Order, 1939, and giving further Directions thereunder and amending the Cheese (Rationing) Order, 1941.
		COCOA, CHOCOLATE AND SUGAR CONFECTIONERY.
674	May 14.	The Cocoa, Chocolate and Sugar Confectionery (Licensing and Control) Order, 1941.
865	June 18.	The Raw Cocoa (Control) Order, 1941.
		CEREALS.
656	May 9.	General Licence, made by the Minister of Food under the Milled Wheaten Substances (Restriction) Order, 1940.
747	,, 29.	The Pigeon Feeding Stuffs (Returns) Order, 1941.
		FRUIT AND VEGETABLES.
658	May 9.	Amending the Potatoes (1940 Crop) (Control) Order, 1940.
815	June 9.	The Preserves (Rationing) Order, 1941.

(*Continued on page* 190)

LETTERS TO THE EDITOR

WHITE *V.* BROWN BREAD

TO THE EDITOR OF FOOD MANUFACTURE

DEAR SIR,—To engage in a duel with my good friend Mr. Fairbrother is always a hazardous occupation, but this time I think I have the choice of weapons. He has been in the unfortunate position, judging from his letter, of writing to comment on an article of mine that he has never seen. At least, he makes no reference to the original, but to the editorial in your May issue, which comments on a contribution of mine to *Biology*. Had Mr. Fairbrother read the original article he would have seen that all my phrases were very carefully qualified. I did not state that wheat should be stored for as long as possible in the form of whole grain, but asked—and it was no mere rhetorical question—whether the milling and baking industries could be so organised that wheat could be stored as such for longer than at present. Mr. Fairbrother has pointed out that, in his opinion, this cannot be done. I have, in fact, achieved one of the objects of my article, which was to elicit more information than is usually forthcoming from the millers' official spokesmen. Perhaps this is because Mr. Fairbrother is not one of them!

I understand that the pre-drying of damp wheats may not be so costly as Mr. Fairbrother suggests, but this again is a matter for the milling experts.

I am not for one moment proposing to controvert Mr. Fairbrother's figures as to the relative selling value of flour, offals and germ. In my original article I was careful to say that the commercial interests of the milling industry "are said to be vitally concerned in maintaining the trade in offals"—and once more left the matter to the experts to discuss. The slight alteration in my phraseology, whether it was made in your leading article or by Mr. Fairbrother matters not, turns what was a carefully framed question into a dogmatic statement that I should not have been justified in making. I may, perhaps, be permitted to ask, nevertheless, whether Mr. Fairbrother's figures really represent exactly what happens. When the population is consuming exclusively, or almost exclusively, white flour, there is a certain over-all consumption thereof. Let us, on the basis of Mr. Fairbrother's figures, take this as 75 cwt. For this the miller gets £38 5s, selling the offals and germ for the balance of £10 9s. 6d. Let us next suppose that the whole population swings over to an exclusively wholemeal loaf. It will still need only 75 cwt., or possibly less, for the wholemeal loaf is distinctly less appetising (to me, at any rate) and more satisfying. But cede the point, and one still wants to know what happens to the balance of 25 cwt. of wholemeal flour. Will it realise, as Mr. Fairbrother's figures indicate, £12 15s., or the price of the 25 cwt. of offals and germ together, or some intermediate level? I don't know, and I again seek information on this matter from Mr. Fairbrother or some other milling expert.

There has been far too much secrecy—whether intentional or otherwise—over the technical and economic factors involved in the controversy about different types of bread, and Mr. Fairbrother's letter is of great value in dispelling some of this. Perhaps the greatest secrecy of all has been the steady refusal of any competent authority to tell us exactly how much calcium carbonate and how much vitamin B_1 is to be present per pound of bread, when the Ministry of Food fortified loaf becomes available. We have been told by Ministry experts how much of the two supplements will be present in "the average amount of bread consumed per day"—whatever that is and whatever value the information is—and we have been told by some experts how much is to be added per sack of flour. None of this information interests the public or even the nutritionists. What both want to know is how the fortified loaf will compare with white bread, wholemeal bread and, now, National wheatmeal bread. This they can only know if they are told precisely the amount of the supplements present in unit weight of bread.

Yours faithfully,
A. L. BACHARACH.

TO THE EDITOR OF FOOD MANUFACTURE

DEAR SIR,—I have read Mr. Bacharach's comments on my letter in your June issue with very great interest, the more so that it now appears that we are in agreement on the essential points. I am unable to say whether the population would eat more or less wholemeal than white bread. As the former contains a good proportion of indigestible cellulose one would imagine that a greater intake would be necessary to make up the calorific value of the bread. However, I do not for one moment propose to argue with Mr. Bacharach on nutritional problems. His knowledge and experience on such questions are far greater than mine. The sole object which prompted me to write the letter commenting on your Editorial was to controvert the possible interpretation that millers were exploiting the public and foisting white bread on them to the millers' own pecuniary gain. I agree with Mr. Bacharach that there has been far too much secrecy about the whole business, and if millers have been regarded with suspicion over this question of white or brown bread they have only themselves to blame. I am not a miller, merely a chemist connected with a milling firm, and for the past fifteen years I have studied the milling industry from a scientific point of view, and frankly and honestly I have seen no signs of the millers exploiting the public. On the contrary, in my experience they have gone to no end of trouble to provide the public with what it wants, frequently to the millers' own pecuniary disadvantage.

I am sure that my friend Mr. Bacharach and I are in solid agreement on one point—that is, to provide the population with the purest and most advantageous food. We are members of that calling that seeks to show up and eliminate the old practices of putting sand in the sugar and water in the tobacco, etc., and, as such, we are genuinely desirous of giving the public the best that is possible. I, personally, however, demand proof of what is the best and am certainly not going to be influenced by the anæmic views of a lot of sedentary Bloomsbury food faddists who are suffering from mental as well as physical constipation.

All I ask for is fair play for the millers who, as far as I can judge, have always played fair with the public. I ask you, Sir, to put yourself in the place of a miller. If you were supplying the public with an article, the demand for which was 95 per cent. against a demand of 5 per cent. for another form of the product, what would you do? Statistics show that, roughly, the demand for white bread is about 95 per cent. to 5 per cent. for brown and, in spite of a frantic campaign of advertising by the Ministry of Food (presumably at the expense of public funds) the demand for wholemeal does not seem to be increasing much. If you were a miller in these circumstances would you mill 95 per cent. of white flour or would you say to the 95 per cent. of your customers, "No, Sir, you don't know what you want or what is good for you; you must have the bread you don't want or don't like because some faddist from Bloomsbury or Whitehall says he knows better what you want than you do"? I believe, Sir, that you would do exactly what the miller does and give the public what it asks for. If and when the nutrition experts have converted public opinion and convinced people that they should eat wholemeal bread then the millers will supply it.

In this connection there is one matter of interest. The food faddists try to make out that white bread consumption leads to moral and physical decadence, and that the people who eat nuts and wholemeal are the finest specimens of humanity. We, as a nation, are the greatest consumers of white bread in the continent of Europe, and in London probably over 95 per cent. of the bread consumed is white, and yet we stood up to the harrowing experiences of the German bombing far better than any of the continental people. I have failed to see much sign of moral or physical decadence among our airmen, our sailors, our firemen and our A.R.P. workers, many of whom have never eaten a slice of wholemeal bread in their lives. One thing wholemeal seems to do very successfully is to generate a lot of gas, much of which is exploded in the House of Commons.

Again, Sir, I wish to stress my plea for fair play for the millers who, after all, are only giving the public what it demands, and I am glad that this correspondence has afforded an opportunity for such a plea. I personally have a great respect for my nutritional friends and their views, but I still agree with Marie Lloyd that a "little bit of what you fancy does you good".

Yours faithfully,
T. H. FAIRBROTHER.

Book Review

THE ZOMBIE OF THE PLOUGH

"British agriculture is not merely a half-dead corpse which the Government of the day can resuscitate whenever there is a war and neglect in days of peace." Mr. Goddard Watts's indignant protest against the treatment of the British peasant as a sort of zombie, exhumed only in wartime to resume a soulless existence of toil for his urban masters is an exaggeration with enough truth in it to make the town voter uncomfortable. This pamphlet* is an attempt to state a policy on which British farming may thrive in peace as well as war.

His programme is a combination of familiar elements. He wants a return to mixed farming in the interests of healthy soil and healthy crops. He demands a better return to farmers through a continuation of guaranteed prices. He admits the need for greater efficiency, which he would ensure by national "supervision" of the land through a continuation of the County Agricultural Committees. He would regulate the relationships of home-produce and foreign produce by means of import boards. He demands wages for the farm worker comparable with those of the town worker. Least conventional of his proposals is his suggested "independent, permanent body" under the Ministry of Agriculture to control the production, processing and retailing of each commodity.

Mr. Watts's object is not only to state a case for the farming community, but to urge the farming interests to undertake propaganda "to win the sympathy and support of the 85 per cent. of the population who live in towns". In agreeing that such a campaign of persuasion would be needed we are brought to the two chief points of criticism to be made against the author's argument. These are his failure to integrate his programme with the needs of the nation as a whole; and his failure to integrate it with the political and economic relations of the nation with primary-producing countries for whom Britain has hitherto been the best market.

The case for a better division of the national income between rural and urban workers is unanswerable, and in dismissing both subsidies and tariffs as the means of removing the present inequality Mr. Watts is no doubt perfectly right. But what is his alternative? Guaranteed prices—inferentially higher prices—must be paid by the consumer. If these higher prices are paid by the consumer out of income they must be reflected in higher industrial costs. Mr. Watts's contributions to this aspect of the problem is to advocate continuance of the food subsidies and introduction of family allowances to enable the very poorest to buy "protective foods" up to the League of Nations scale.

As far as concerns the effect of his programme on the export trades the author, beyond speculating that the import boards' purchases of food which cannot be grown at home will have a stabilising effect on prices and thus benefit the overseas producer, does not face the dilemma of any statesman of the post-war world who has to reconcile the demand for protection of the home producer with a relaxation of the restrictions on international trade which were so direct a cause of this and previous wars. In the economic and social conditions which now rule the world it is impossible to escape the conclusion that to encourage the home farmer to produce dear food means a reduction in the amount on cheap food which can be bought from the foreign producer, at the same time further contracting the markets of the home manufacturer of exported goods.

Mr. Watts has made out a sound case for the farmer, but his policy solves the agricultural problem only by transferring it to a higher plane. The only hopeful solution to the wider problem thus stated is a plan of economic and social development on a world-wide scale which will so expand purchasing power that markets will be created for all the food and goods the farmers and manufacturers of the world can produce. Why not?

So far, however, from anticipating any such desirable development, Mr. Watts declares himself a believer in the odd theory that "we may be too poor after the war . . . it is almost certain that we shall have to live more simply . . . we shall not be able to afford to import it (food) in the pre-war quantities." Behind this assumption—admittedly widespread—is the familiar confusion between wealth and money.

There is no reason at all for believing that the economic situation of the next post-war period will differ essentially from that of the last one. It will be excess productive capacity, not scarcity, which will plague the world's producers. Even the liquidation of British financial holdings overseas, limiting as it must the possibilities for cheap imports, will be a comparatively minor factor in the larger problem of adjusting producing capacity to effective demand.

On one more point I should like to quarrel with Mr. Watts: that is his perpetuation of the Myth of the Noble Peasant. If there is anything at all in the mystical conception of rural life as being essentially more vital and humanly satisfying than urban life, I know of no scientific evidence for it, and some evidence against it. But the important thing from the point of view of Mr. Watts's argument is that it does nothing to help his case. There is no reason in the world why the factory worker should pay more for his bread and butter so that the farm worker should conserve a vitality which, says Mr. Watts, oozes out of town dwellers in three generations.

The problems of agriculture are the problems of an industry, a part only of the larger food industry—a part of an industry whose equipment and raw materials includes the soil and the sun, rain and frost, and the living bodies of animals, as well as mechanical plant. In the last resort it will be judged by its ability to supply good food at reasonable prices. The crux of the matter, as Mr. Watts's pamphlet seeks to prove, is that it is for farmers to satisfy the consumer that their products are worth the price.

A. E. B.

* "An Agricultural Policy for Britain and a Policy for British Agriculture." *By G. Goddard Watts. Pp. 34+x. London.* 1s.

CALCIUM IN FORTIFIED BREAD

The following statement concerning the effect upon invalids of bread made from flour "fortified" by the addition of calcium salts has been issued by the Medical Research Council:

The exigencies of the present situation have forced upon the people of the country a diet which requires, if health is to be maintained, the addition of a supplement of calcium salts. The need for this supplement is brought about in two main ways: (1) the war-time diet tends to be deficient in available calcium, especially since restrictions have been imposed upon the sale of milk and eggs; (2) the high content of cereal foods in the diet increases the amount of calcium it is necessary to ingest; this is partly because most cereals are deficient in calcium but also because the presence of phytic acid in cereals often prevents the body from making use of the calcium they contain. The Ministry of Food has asked the Food Rationing (Special Diets) Advisory Committee whether the addition of small supplements of calcium salts to flour would be in any way deleterious to invalids. In reply the committee expressed the opinion that "there is neither medical nor scientific evidence that the consumption of bread made from flour fortified by the addition of appropriate quantities of calcium salts is harmful to patients suffering from any type of disease". This opinion was based on the following considerations.

It has been proposed by the Accessory Food Factors Committee of the Lister Institute and of the Medical Research Council that 14 oz. of calcium carbonate be added to each 280 lb. of 85 per cent. extracted flour and 7 oz. of calcium carbonate to each 280 lb. of white flour. Expressing these quantities in other terms, it can be said that 1 lb. of the "fortified" 85 per cent. extracted flour and 2 lb. of the "fortified" white flour contain slightly less calcium that 1 pint of fresh milk. There can therefore be no objection to the use of this fortified flour on the grounds that it will result in the consumption by invalids of harmful amounts of calcium. It is, however, necessary to dispel a current misconception with regard to the qualitative aspect of this fortification. It has been suggested that the consumption of fortified flour might have a deleterious effect upon certain invalids, not because of the increased calcium content, but because the calcium added to it is in a form—the carbonate of calcium—different from that which exists naturally in food and that this carbonate of calcium is harmful.

This criticism appears to be ill founded. There is direct evidence obtained on human beings that the calcium of calcium carbonate is as available to the body as that of calcium phosphate. In an easily assimilable food, such as milk, calcium is in the form of a combination with a phosphoric acid, a common normal component of animal tissues; in calcium carbonate, calcium is also present as the salt of an acid of widespread occurrence in living tissues. In both cases the calcium is split off from the acid during the process of digestion and is absorbed into the body in the same form in each case.

MACARONI PRODUCTS

According to published figures, imports of macaroni have been steadily increasing. An outstanding aspect of these imports are those from Canada, which almost doubled between 1937 and 1939. Considerable interest is being evinced in the manufacture of macaroni products in this country, but there are difficulties in the direction of supplies of raw material and plant.

SPECIALLY CONTRIBUTED

THE origin of this food is lost in the mists of antiquity. In pursuance with their little habit of starting things, the Chinese seem to have been the first in the field. Renato Rovetta, *Industria del Pastificio o dei Maccheroni*, mentions that paste was made in Pe-tche-le, 5,000 B.C., from rice meal.

The Germans learned the method of preparation as a result of contacts with the Chinese about the end of the thirteenth century, and in their turn the Italians got it from the Germans. Owing to the better quality of Italian wheat, superior drying conditions and other factors, they made a better quality paste and from the fourteenth to about the middle of the nineteenth century they enjoyed a monopoly on European production. The production was so great that semolina flour was imported from France, and the French in time became competitors, although Italy retained the lead both in manufacture and consumption, and the product became a national dish.

Production in U.S.A.

It was in 1870 that large-scale production became established in the U.S.A., but not until 1900 did it assume any appreciable commercial importance. It was after the 1914-1918 conflict that the industry seriously was able to meet foreign competition, and from then on it has gone from strength to strength. In 1910 the production was estimated at 200,000,000 lbs., in 1914 300,000,000 lbs. and in 1920 450,000,000 lbs. In 1931 this had increased to 524,000,000 lbs. The average total export of macaroni products from 1927 to 1932 amounted to 7,521,000 lbs.; in 1940 this had dropped to 3,589,978 lbs., due to world conditions.

British Imports

The main sources of macaroni products coming into the United Kingdom during 1937-1939 (1939 being the latest year for which particulars have been published) were Canada, Belgium, France, Italy, and U.S.A., as shown in the table, which gives the total quantity and declared value of macaroni, spaghetti and vermicelli imported into the United Kingdom during the years 1937, 1938 and 1939, distinguishing the principal countries from which consigned.* The most noteworthy item is the enormous increase in Canadian products, which had almost doubled in the period. The U.S.A. considerably increased its exports to this country, but they only amounted to about 6·5 per cent. of those of Canada.

Raw Materials

Macaroni products are made from semolina, the hard, glutinous part of the wheat grain. It makes up part of the middling used in breakfast foods. Certain strains of hard wheats are particularly rich in this substance and have been bred for this quality, and macaroni products are made primarily from semolina obtained by milling durum wheat. Prior to the year 1904, durum wheat for the manufacture of semolina was grown in Russia; it is also grown extensively in Algeria and in the U.S.A., as well as Canada, Chile, Syria, Spain, Italy, India, Rumania and the Argentine.

Durum wheat is classed as *Triticum durum*, and is flinty and semi-translucent; ordinary spring and winter hard wheats belong to *Triticum vulgare*.

Among the different sub-classes and grades of durum wheat amber durum is the most suitable for the production of semolina, as it combines strength with a most desirable creamy-yellow colour. Red durum produces a macaroni of a dull grey colour and is consequently not used in a general way.

The average composition of durum wheat is as follows:

	Per Cent.
Moisture	10·40
Ash	1·8
Fat	2·5
Fibre	2·6
Protein (N × 5·7)	14·1
Nitrogen-free extract	68·6

Semolina and Farina

Semolina has been defined by the National Macaroni Manufacturers' Association as "the purified middlings obtained from the grinding of durum wheat. It is free from bran and other offal and shall contain not more than 13·5 per cent. moisture and not more than 1 per cent. flour."

Farina is "the purified middlings obtained from the grinding of hard wheats other than durum wheats. It is free from bran and other offal and shall contain not more than 13·5 per cent. moisture and 1 per cent. of flour."

The composition of farina is essentially the same as that of semolina except that the ash in farina is about 0·45 per cent.

Types of Macaroni

The forms in which macaroni is offered are legion. In British households the most common is the smooth, tubular form, of which there are several different sizes.

Corrugated tubular products and the solid rods are other varieties, which include vermicelli and spaghetti, an excellent canned form of which is put up by well-known canners.

Other types are flat ribbons and short cut macaroni, the latter used for soups.

IMPORTS OF MACARONI, SPAGHETTI AND VERMICELLI INTO THE U.K.

Countries from which Consigned.	*Quantity.*			*Declared Value.*		
	1937. *Cwts.*	1938. *Cwts.*	1939. *Cwts.*	1937. £	1938. £	1939. £
Macaroni, spaghetti and vermicelli						
Total imports of which consigned from:	99,349	113,895	124,487	147,060	159,884	169,080
Canada	42,090	61,722	83,522	59,776	80,463	108,603
Belgium	19,026	14,067	8,051	25,090	17,400	9,292
France	18,504	24,408	19,154	30,800	37,954	25,836
Italy	13,221	9,239	7,179	21,794	17,093	12,900
U.S.A.	1,190	1,821	5,486	2,459	3,198	10,149
Other countries	5,318	2,638	1,095	7,141	3,776	2,210

* *Abstracted from Vol. II. of the "Annual Statement of the Trade of the United Kingdom", 1939.*

Manufacturing Methods

The main operations concerned in the manufacture of macaroni are mixing, kneading, pressing and drying.

Prior to 1800 all pastes were made by hand. The flour and water were mixed in a dough trough, and when completed the dough was spread on top of a specially strong, heavy table and rolled until it was of the desired thinness. It was then cut into ribbons of different widths or cut into pieces and folded or stamped into different shapes.

The first attempts at mechanising the process consisted in the adoption of the screw press.

The use of kneading machines followed.

Pastes are made by moistening the semolina with the minimum quantity of water necessary to convert it to a smooth tough dough. It is kneaded continuously for from 10 to 30 minutes, the time varying according to the composition of the batch and the nature of the final product desired. The amount of water used varies from 26 to 30 lbs. for every 100 lbs. of semolina or farina, and the temperature of the water at the time of addition from 70° to 140° Fahr.

Allowing for inevitable manufacturing losses of from 1 to 2 per cent., 100 lbs. of flour will make 94 lbs. of macaroni.

The modern kneading machine consists of a revolving circular steel pan carrying two corrugated conical iron rollers weighing as much as 3½ tons each. These are supported in such a way as to exert pressure on the dough as it is carried around by a circular power-driven pan.

After kneading the mass is then placed in a power press capable of exerting a pressure of 2,500 lbs to 5,000 lbs. per square inch and the dough forced through openings in a pattern which gives the size and style of product.

The presses are either vertical or horizontal. In the vertical press a horizontal die is placed at the bottom of the cylinder, the holes in the die corresponding to the type of macaroni to be made. The holes have small steel rods in the centre, which produce the hollow form of the macaroni, the dies for making the solid forms having smaller holes without pins.

Horizontal presses are used for the manufacture of short-cut macaroni products.

Drying the Macaroni

The drying operation is the most complicated item of the process. Although in Italy drying in the open air is often carried out, in most modern plants drying chambers through which a current of filtered air is conducted by means of fans are used. The temperature of the air is maintained at from 70° to 100° Fahr.

A preliminary drying of about two hours' duration is considered necessary to prevent the development of mould. The macaroni is then placed in a damp chamber in order to make uniform the moisture content throughout the product and to develop the characteristic flavour. After this preliminary treatment the macaroni is transferred to the drying chambers. The long-cut macaroni is hung on sticks or canes and placed in the drying chambers, while short-cut macaroni is spread out on wire-mesh trays.

A typical drying chamber for short goods holds ninety-six trays containing about 1,500 lbs. of spaghetti. Air at a velocity of 75 to 85 feet per second is circulated through the material, the direction of the air being changed every two hours. Fresh air is supplied by leakage on the suction side, and the humid air is discharged by leakage from the reverse side into the room.

The drying takes from 36 to 90 hours. Unduly rapid drying is avoided as it affects not only the flavour but the physical attributes of the finished product, due to the uneven distribution of moisture throughout the mass.

A recent contribution to the consideration of the drying of macaroni is by Paul L. Earle and M. C. Rogers (*Ind. and Eng. Chem.*, **33**, 5, 642). The work had for its objectives the determination of rates of drying now in use commercially and the determination of the rates which might be expected under various conditions. Such considerations as equilibrium moisture; constant rate drying period; falling rate period; drying at high humidities, etc., are discussed by the authors.

Composition

The finished product is hard, of a light straw colour, semi-translucent. It should be pliable and long pieces capable of being bent. It should break with a clean, glassy fracture.

Wiley, *Foods and their Adulteration*, gives the composition of macaroni of American and other sources:

	American. (*Per Cent.*)	*Other Sources.* (*Per Cent.*)
Moisture	10·27	10·32
Fat or ether extract	0·42	0·35
Crude fibre	0·49	0·53
Protein	11·61	12·29
Starch and sugar	76·52	76·10

Macaroni products are particularly notable for their digestibility, as, made from semolina or farina, they are essentially free from fibre.

Sherman, *Chemistry of Food and Nutrition*, gives the following:

Protein (N × 6·25)	13·4 per cent.
Fat	0·9 ,, ,,
Carbohydrate	74·1 ,, ,,
Fuel value per pound	1,625 calories.
100 calorie portion	28 grams

Macaroni from other Materials

Macaroni is made from products other than semolina, farina or flour. These may be rice, corn and some varieties of beans. The Chinese make vermicelli from wheat flour, mung bean and rice, and the Mexicans produce spaghetti and vermicelli from maize, by a process in which a special flour is made from the whole kernel by boiling in milk of lime for half an hour.

Gluten macaroni is used for special dietetic purposes. Twenty-five to thirty per cent. wet gluten is mixed with semolina to increase the protein content of the product. Issoglio gives a protein content of a gluten macaroni at 25 per cent. compared with 10·5 to 14·6 per cent. for the ordinary product.

Noodles

Noodles consist of dried macaroni mixture prepared from flour, semolina or farina, and contain at least 5·5 per cent. (on a moisture free basis) of whole egg or egg yolk solids.

Noodles differ from ordinary macaroni products in that they are usually made from flour and contain at least 5·5 per cent. (calculated on a moisture free basis) of whole egg or egg yolk solids. The following definitions and standards for noodles have been adopted by the United States Department of Agriculture:

Noodles, Egg Noodles, are the shaped and dried doughs prepared from wheat flour and eggs, with or without water, and with or without salt. The egg ingredient may be whole egg and/or egg yolk. In the finished product the moisture content does not exceed 13 per cent.; and the egg content, upon the moisture-free basis, is not less than 5·5 per cent. by weight of egg, calculated as whole egg solids. Noodles are commonly ribbon-shaped.

Plain noodles are the shaped and dried doughs prepared from wheat flour and water, with or without salt. In the finished product the moisture content does not exceed 13 per cent. Plain noodles are commonly ribbon-shaped.

The best noodles are made from hard-wheat flour, though not necessarily durum flour. Dried whole egg or dried egg yolk and in some cases canned eggs or even fresh eggs are used.

Manufacture of Noodles

The dough, consisting of flour, eggs and water, is mixed and kneaded in machines similar to those used in macaroni manufacture.

It is then passed between heavy rolls, which gradually reduce it to a broad ribbon or belt of about one-half inch thick and from 12 to 18 feet long. It is then further reduced to a thickness of one-eight inch or less, after which it is cut into thin strips by a special shredding machine. The strips are folded and dropped on trays in an even layer and dried, usually for 24 to 48 hours. After the dough has been pressed sufficiently thin and uniform, and before it is dried, it may be cut into shapes by the use of dies.

Canned Spaghetti

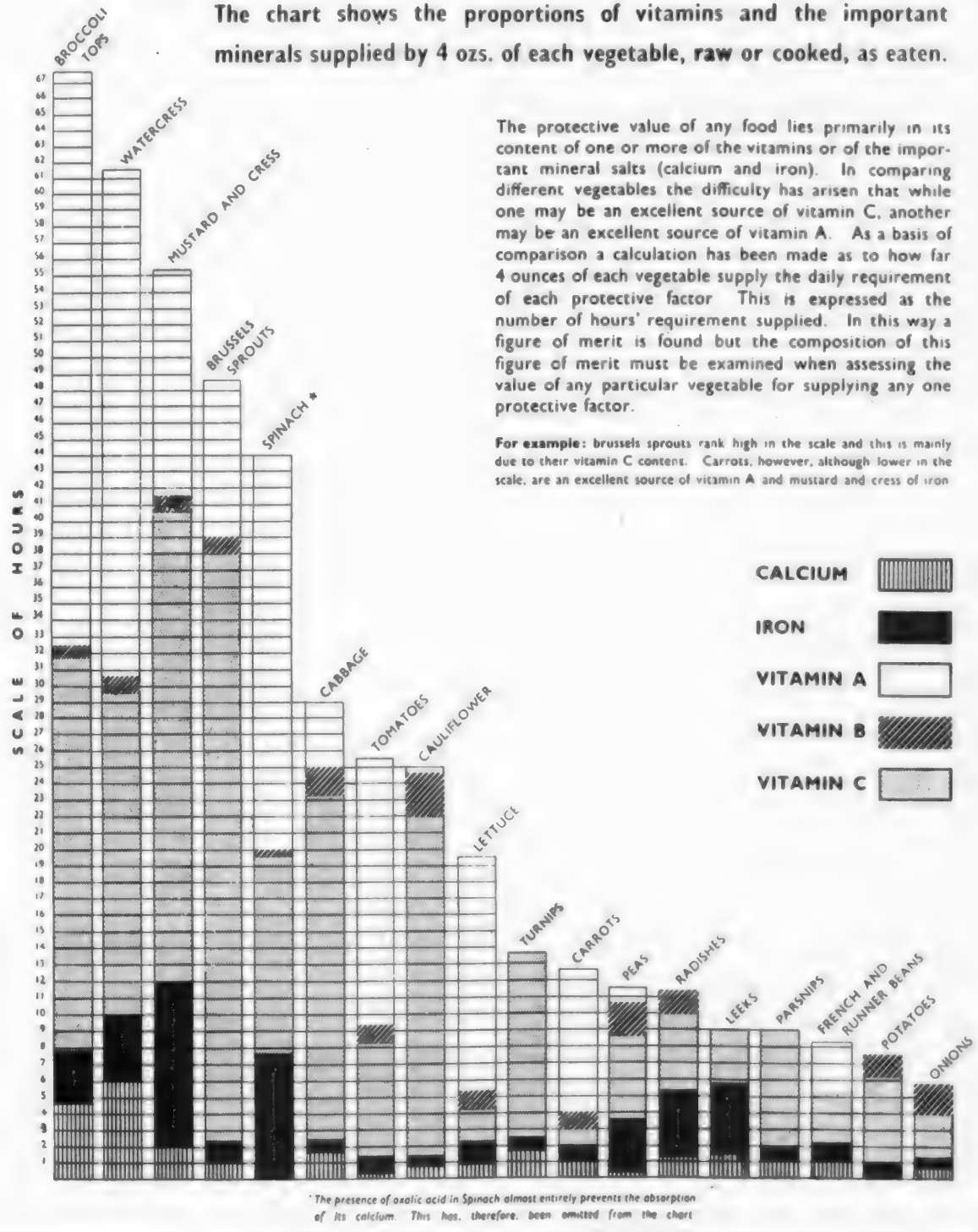
The dry spaghetti is cooked in a steam jacketed pan for 30 minutes. After cooking, the material is placed on a moving wire belt, where it is flushed with cold water to remove free starch.

A sauce containing tomato purée cheese, flavourings, etc., is added in the proportion of 50/50.

An interesting patent is U.S.P. No. 1,634,332, in which the uncooked spaghetti is placed directly into the cans, thus eliminating preliminary cooking in jacketed pans.

VEGETABLES AS PROTECTIVE FOODS

The chart shows the proportions of vitamins and the important minerals supplied by 4 ozs. of each vegetable, raw or cooked, as eaten.



The protective value of any food lies primarily in its content of one or more of the vitamins or of the important mineral salts (calcium and iron). In comparing different vegetables the difficulty has arisen that while one may be an excellent source of vitamin C, another may be an excellent source of vitamin A. As a basis of comparison a calculation has been made as to how far 4 ounces of each vegetable supply the daily requirement of each protective factor. This is expressed as the number of hours' requirement supplied. In this way a figure of merit is found but the composition of this figure of merit must be examined when assessing the value of any particular vegetable for supplying any one protective factor.

For example: brussels sprouts rank high in the scale and this is mainly due to their vitamin C content. Carrots, however, although lower in the scale, are an excellent source of vitamin A and mustard and cress of iron.

* The presence of oxalic acid in Spinach almost entirely prevents the absorption of its calcium. This has, therefore, been omitted from the chart.

(Courtesy Vitamins, Ltd., and "School and College Management.")

Notes on the Chart

1. Asparagus, cucumber, celery, marrow and pumpkin are of such low nutritional value that they are not included in the chart. They must be regarded either as luxuries or as pleasant adjuncts to other dishes.

2. As a matter of convenience, the chart is based upon 4-ounce portions. This method of presentation does bare justice to the value of potatoes—which can be eaten in considerably large amounts. Conversely, it somewhat exaggerates the relative importance of mustard and cress, watercress and lettuce.

3. It will be seen that no vegetable contains vitamin D. (The only exception is the mushroom which, when grown in sunny spots, may contain a small amount; too little, however, to be of any importance. The vitamin D of the diet must be otherwise supplied, as, for example, in one of the fat fish.)

4. So far as vitamins are concerned, the chief value of vegetables is for vitamins C and A of which, as the chart shows,

several are excellent sources. Vegetables are, however, poor sources of vitamin B, which must be supplied in the diet by other means—for example, bemax or, to a lesser extent, by wholemeal bread.

5. The main sources of calcium in the diet are milk and cheese. Certain vegetables are useful supplementary sources, but it would be necessary to eat inconveniently large amounts of vegetables if the calcium intake from this source were to be of much real value.

6. Although spinach and mustard and cress are good sources of iron it is difficult to obtain enough of this mineral from vegetables alone. Wholemeal bread and bemax, both of which can be eaten daily, will go far to supply the full requirement of iron in the diet.

7. Among the onion family it will be seen that leeks are superior to onions. Spring onions, not shown on the chart, are similar to leeks.

8. Swedes are not shown in the table, but their value is very similar to turnips although slightly lower.

9. The outer leaves of cabbage, lettuce, etc., contain far more nutritional value than the lighter coloured and more tender heart. They should be used in soups.

10. If vegetables are kept long after cutting, certain valuable properties are lost. This applies especially to lettuce.

11. The distribution of vitamin E is at present not sufficiently well known to be included in the chart.

12. It is believed that the graphical method of presentation employed in the chart will enable meals to be made up on a sound nutritional basis without recourse to complex tables of figures.

Many of the figures for vitamin contents depend upon biological assays which are always subject to some variation.

THE PREPARATION AND COOKING OF GREEN VEGETABLES

THE following note on the preservation of the vitamins and salts in the processes of preparing green vegetables for the table has been drawn up by the Medical Research Council's Accessory Food Factors Committee.

Conservation of Vitamins

Vitamins are lost or destroyed in the preparation and cooking of greenstuffs by many of the methods now in common use. As it is of special importance at the present time to secure the maximum nutritive value from all the foods available, it is desirable to employ methods of preparation and cooking of foodstuffs which conserve their nutrients to the utmost.

The following generalisations summarise our knowledge of the behaviour in greenstuffs of the vitamins most likely to be affected in the course of preparing green vegetables for the table. Some simple rules based on these generalisations are given and cooking methods for greenstuffs are recommended.

Fat-soluble vitamin A is unlikely to suffer damage; water-soluble vitamins B and C are the most likely to be lost on preparation and cooking. This is so for the following reasons:

(i) Because they are water-soluble, they are dissolved out by soaking or cooking water, they also run out in the watery juice.

(ii) Raw vegetables contain enzymes which are active in destroying the vitamins, particularly if the raw foodstuff is left lying about after being bruised or cut up. These substances which destroy the vitamins become more active as the temperature rises during cooking up to a point at which they themselves are destroyed. This point of destruction is only a few degrees below boiling temperature.

(iii) The water-soluble vitamins are themselves also destroyed by heat to an extent which depends on the length and severity of the heating.

(iv) The water-soluble vitamins are found to diminish in amount in foods left standing after they are cooked.

(v) Salt or sugar added to vegetables before cooking lessens the amount of destruction under conditions described in (iii) and (iv) above.

(vi) Vitamins B and C are more stable in the presence of acid, which is sometimes added as vinegar. The addition of alkali (carbonate or bicarbonate of soda) will, on the other hand, hasten the destruction of the vitamins.

Practical Rules for Treating Green Vegetables

(1) Obtain as fresh as possible.

(2) Keep in a cool damp place in order to reduce wilting.

(3) Take precautions to avoid damage due to crushing or bruising during transport or handling.

(4) If vegetables are soaked use salt water (two teaspoonfuls to one pint).

(5) If vegetables are to be shredded or finely chopped for salads, prepare immediately before serving.

(6) Use the smallest possible amount of water for cooking.

(7) Have water boiling before adding vegetables.

(8) Add salt to water before adding vegetables.

(9) Add vegetables gradually or in small amounts at a time, in order to prevent water going off the boil.

(10) Cook vegetables no longer than is necessary to render them tender.

(11) Plan cooking arrangements so that vegetables are dished up and served immediately after they are cooked. On no account allow to stand for a long time on a hotplate.

(12) If there is water left after cooking, drain off and use in the preparation of soups and gravies; alternatively, if successive batches are being cooked on the same day, use the same water again, adding more if necessary.

Methods Resulting in Least Loss of Vitamin C

Method I.—Boil for the shortest time in a small quantity of boiling salted water. Use water left over for boiling other batches and for addition to soups and gravies.

Method II.—Slice the fresh vegetables into ribbons about 2 to 3 inches long by ¾ inch wide and cook briskly for half to one minute in a small quantity of hot oil or dripping to which salt has been added (two teaspoonfuls oil and half teaspoonful salt to an average-sized cabbage). Add a small quantity of boiling water (half to one cupful for above) and stew for about ten minutes in a closed container. Keep the lid on so that no steam escapes. When the vegetables are cooked only a very little water should be left. This method is used throughout the Far East and India. In Europe the nearest approach to it is the French method of "casserole" or "conservative" cooking, by which vegetables are placed in a closed fireproof dish with a little water and fat and cooked in the oven or over a low flame for 15 to 25 minutes.

In hay-box cookery vitamin C is destroyed, so that this method should not generally be used for cooking green vegetables, which are particularly valuable in the diet for their vitamin C content.

Steaming of vegetables even with the best equipment is not as satisfactory as the methods described above.

Conservation of Salts

If the precautions described above are carefully taken, it can be relied on that effective conservation of the valuable salts present in green vegetables will also be secured.

Statutory Rules and Orders

(*Continued from page 184*)

No.	*Date.* 1941.	
		FRUIT AND VEGETABLES (*contd.*).
823	June 10.	Amending the Potatoes (1940 Crop) (Control) Order, 1940.
824	,, 10.	General Licence and Directions under the Potatoes (1940) Crop (Control) Order, 1940.
		GENERAL.
676	May 14.	The Vitamin C (Control) Order, 1941.
786	June 3.	Amending the Rationing Order, 1939.
806	,, 6.	Amending the Livestock (Sales) Order, 1940.
807	,, 6.	Amending the Livestock (Sales) (Northern Ireland) Order, 1940.
809	,, 7.	Directions under the Sale of Food (Public Air Raid Shelters) Order, 1940.
810	,, 7.	The Vitamin A (Control) Order, 1941, Prohibits the manufacture or processing of Vitamin A of specified potency, and the use of any Vitamin A, except under licence of the Minister. The restriction does not apply to the use of Vitamin A for medicinal, pharmaceutical or scientific purposes. Those licensed to manufacture or use Vitamin A must keep accurate records of their production or use. The records are open to inspection by authorised persons, who may also enter any premises and take samples in order to secure compliance with the Order or a licence.

NEWS FROM THE INDUSTRY

National Wheatmeal

The Ministry of Health has issued the following notice to County Councils, County Borough Councils, Mental Hospital Boards, Joint Boards and Visiting Committees, and other Local Authorities with hospitals in the Emergency Hospital Scheme, all other Local Authorities and Joint Hospital Boards, Voluntary Hospitals in the Emergency Hospital Scheme.

"I am directed by the Minister of Health to call the attention of the authority to the desirability on nutritional grounds of making available to patients and staffs of hospitals within the Emergency Hospital Scheme and to inmates and staffs of any other residential Institutions under the control of local authorities, bread made of national wheatmeal flour.

The Minister has been in consultation with the Minister of Food on this matter and he is advised that national wheatmeal flour is now available to bakers. This flour contains the greater part of the germ of the wheat, with some of the finer bran, but excludes the coarser bran. It thus contains not only most of the vitamin B_1, but also most of the remainder of the vitamin B complex, as well as valuable mineral elements which are removed in producing white flour. National wheatmeal flour is therefore of high nutritional value and is particularly valuable at times when there is restriction upon the availability of other foods from which these vitamins and minerals could be obtained.

Bread made of national wheatmeal flour should be of a pale brown colour and of a flavour and texture closely similar to white bread. Owing to the exclusion of the coarser bran, it should be readily tolerated by patients—*e.g.*, with digestive complaints—who do not easily tolerate bread made from coarser brown or wholemeal flours.

If in any particular district difficulty is found in obtaining bread made of national wheatmeal flour, I am to suggest that the authority should bring the facts to the notice of the Bread Branch, Ministry of Food, Mount Stewart, Colwyn Bay, North Wales.

A copy of this circular has been sent to the Medical Officers of Health."

* * *

Less Chocolate for the Services

By agreement between the Ministry of Food and the War Office a considerable reduction is to be made immediately in the quantity of chocolate, sugar, and sweet confectionery supplied to N.A.A.F.I. canteens for men of the Services.

A N.A.A.F.I. official stated recently that in future their chocolate supplies would be practically halved. Certain troops would be hard hit, particularly the bomber and fighter crews, who received a special cash allowance of 1s. 6d. a night with which to buy light, compact rations for their operations. Invariably they had spent part of that allowance on chocolate. With more and more men in the air each day and night the demand for chocolate would increase.

OBITUARY

Mr. Richard Maynard Leonard

We regret to record the death, at Hampstead on July 13, of Mr. Richard Maynard Leonard. At the funeral, which took place at Golder's Green Crematorium, Sir John Parsons, F.R.S., delivered an address.

Mr. Leonard was the son of the Rev. H. C. Leonard, of Clifton, Bristol.

One of his many activities was connected with the food industry. In 1906 he became secretary of the Food Manufacturers' Association and about the same time secretary of the Manufacturing Confectioners' Alliance. He represented the latter at International Conferences at Geneva.

During the early part of his life he was on the staff of the *Pall Mall Gazette* and subsequently the *Westminster Gazette*. He took part, in co-operation with Lord Russell of Killowen and Sir Edward Fry, in securing the passage into law of the Prevention of Corruption Act, 1906, and was secretary to the Anti-Bribery League, formed shortly after, until his death.

A lover of literature, Mr. Leonard wrote many anthologies, which were published by the Oxford Press. Among these were *The Dog in English Poetry, A Book of Light Verse, Pageant of English Prose, Book-lovers' Anthology, Poetry of Peace, and Oxford Garlands* (15 vols.). He was editor of *Periodical*, a publication started by the Oxford University Press some forty years ago.

His wife, two sons and a daughter survive him.

No More White Bread

There will be no more "white bread" available in the Union of South Africa for a long time. The Union has had to import so-called "hard wheat" from Canada to make up for the deficiency in the grade of home-produced wheat for bread making, and the wheat cannot now be imported owing to the requirements of shipping for war purposes. The Government has therefore decided to introduce a standard loaf in which only whole wheat is used. Dietitians maintain that this bread is more nutritious than white bread or the brown variety made of unsifted flour.

* * *

Inoculation for Colds

Before last winter, Lord Nuffield made arrangements that those of his employees who so wished could be inoculated at his expense against colds.

A check has been kept on the results. Out of a test batch kept under careful observation, 1,003 employees who were inoculated lost 882 days due to colds, whereas 957 employees who were not inoculated lost 968 days during the same period.

Thus, inoculation reduced the loss of work due to colds by 13·6 per cent. during the winter period—adequate proof of the value of the Nuffield Voluntary Scheme.

Similar arrangements will be made for next winter.

* * *

Protection of Food from Gas

Instructions for the protection of foodstuffs from contamination by poison gas have been issued by the Ministry of Food to the food trades and those responsible for the storing of food supplies. It is considered that the greatest caution is essential.

The Ministry recommends that wherever possible foodstuffs should be kept under cover and not stacked in the open. They should be given protection during handling at every point where they are normally exposed to the air, particularly foodstuffs which are not in sealed containers.

Tarpaulin sheets of the oil-dressed type offer the best temporary protection for stocks in the open, but if these are not available, screens should be improvised with canvas, sacking, or corrugated iron, and kept out of direct contact with food.

In warehouses and other store places food which is not in sealed containers should, if possible, be stored on middle floors and away from windows; and additional cover should be given by protective sheets. It is recommended that loose waterproof sheets or other covers should always be kept at hand. Meat in cold storage is considered safe from contamination.

If food is affected by poison gas, or there is a suspicion that it might have been, it should be examined by an authorised officer of the local authority, who will decide whether it can be decontaminated on the spot or if it is necessary to remove it for treatment elsewhere.

Britain's Foreign Trade Maintained

There was no falling off in Britain's foreign trade from January to April of this year. Mr. Harcourt Johnstone, Minister for Overseas Trade, states that he can say this, although the Government decided at the beginning of the year not to publish export trade figures. "In spite of the progressive loss of markets through Germany's invasion of half the countries of Europe," he said, "our foreign trade still managed to maintain an extraordinarily high pre-war level. In the last complete pre-war year, which was 1938, we exported £471,000,000 worth of goods, but as a result of the industry of our people and the enterprise of our manufacturers in the first full year of war, 1940, we exported £413,000,000 worth of goods. That was a truly remarkable result, considering that we had lost fully 30 per cent. of our markets."

* * *

Tin for Soviet

The work of co-ordinating the Soviet requests for economic assistance with British and Allied productive capacity is being arranged from Moscow by Mr. Laurence Cadbury, the director of the Bank of England, who recently arrived there on the politico-economic mission from Britain.

He will work in close contact with Mr. C. H. P. Gifford, adviser on commercial questions to Sir Stafford Cripps. Mr. Gifford has already been in Moscow for some time and has a complete knowledge of Russian requirements. Tin from the Straits Settlements will probably be among the first shipments sent to Russia.

* * *

Egg Rationing

Provision for preferential treatment for children, and for sick and delicate people, in egg rationing is under consideration by the Ministry of Food with the help of the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council.

* * *

New Commissioner for Newfoundland

The King has approved the appointment of Mr. P. D. H. Dunn to be a member of the Commission of Government of Newfoundland in succession to Mr. J. H. Gorvin, who is returning to resume duty in this country, where his services are required in the Ministry of Food.

* * *

Meat from New Zealand

The British Government has contracted to buy 248,000 tons of New Zealand meat in the production year ending September 30. The Minister of Marketing, Mr. Barclay, states that this quantity is less than the first war contract for 300,000 tons, but substantially above the 180,000 tons which the British Government had previously considered to be the maximum for which it could contract. The disposal of the unsold surplus of meat will still be a major problem for New Zealand, but it is hoped that the development of canning will dispose of some of it.

Tinplate in Australia

It is announced from Melbourne, according to Reuter, that tinplate from the United States may be admitted duty free. This decision is intended to facilitate measures which the Government is planning for the conservation of Australia's meat export surpluses. Alleged pre-war opposition by British manufacturers to the establishment of the industry, it is said here, "unfortunately makes the foregoing attempt to obtain American tinplate necessary".

* * *

Fish Trade Reorganisation

Mr. John Adamson has undertaken with others to reorganise the fish trade. He is an expert in buying and distributing food, and was appointed in May last to take control of the Food Ministry's Fish Department. He is a partner of McClelland Ker and Co., chartered accountants.

* * *

Inshore Fishing

In the interests of increased food production an Order has been made authorising vessels other than steam trawlers to fish for seafish by means of trawl, seine, or draw-nets within the three-mile limit round the coasts of England and Wales. The Order overrides restrictions on such fishing contained in by-laws made by local fisheries committees, but it does not affect the operation of any military or defence restrictions. The provisions of the Order do not apply to fishing for salmon or migratory trout or for shell fish.

* * *

Cylinder Drying of Milk

The mechanics of milk powdering and milk processing are generally known, and it is recognised that quality and output of processed material are limited to quality of drying and output of the equipment used. If, for instance, a steam-heated drying machine is prone to waterlog, or if heat transference is impeded by the presence of air in the steam spaces, the result must be an output lower than maximum and in all probability a quality of processed product which is lower than a desirable standard.

A development which takes care of just those problems on twin-cylinder milk-drying machines is of interest. This development is an advanced method of draining condensate and venting air from the cylinders, designed and manufactured by Spirax Manufacturing Co., Ltd. It is sound in principle, and there is considerable evidence to show that it is entirely successful in practice. Its primary function is to keep the drying cylinders entirely free of water of condensation and of air during the full period of operation.

A good idea of its efficiency and of its importance to the milk processing industry at the present time may be gained from the following details: It makes possible a considerable saving in starting-up time. It greatly increases drying efficiency because full steam heat is quickly transferred to the surface of the cylinders unretarded by condensate or air. There is a resultant steam economy which may be anything from 10 to 15 per cent. of total steam consumption. Because of the really rapid discharge of all condensate and air from the steam spaces the temperature on each cylinder is maintained steadily, resulting in even drying over the whole of the cylinder surface and a corresponding improvement in quality of drying. There is, naturally, less risk of spoilage. Because of the improved quality of drying it is possible to increase machine speed. This improvement added to the saving of starting-up time makes for a substantially increased output. The installation of the unit, which is of neat and simple character, taking up very little space, calls for no more than a minor alteration to existing pipe-work.

A notable feature of this system is that it treats each cylinder as a separate drying unit, permitting the free passage of condensate from each without interference from the other, and the sight-glass fitment makes the working of each cylinder visible at all times.

The processing industry is showing a close and practical interest in this development, and it is significant that independent confirmation of the efficiency of the system comes from Messrs. Bertrams, Ltd., who make so many of the twin-cylinder milk-drying machines used in this country.

* * *

Hand-Operated Double Seaming

As a result of the Government appeal throughout the country for the storage and preservation of fruit, vegetables, fish, etc., F. J. Edwards, Ltd., have recently developed a new entirely hand-operated double seaming machine. This seamer is intended for use in institutes, domestic households, hotels and laboratories where small outputs have to be catered for.

It is arranged with convenient hand clamp for fixing to a table or bench, and the machine has been simplified as far as is possible so that practically any unskilled persons can efficiently close the cans. Base plate location is provided so that the cans centralise themselves readily when being clamped.

Changing from one size to another is extremely simple and quick. The seamer will close any standard fruit can as supplied by various makers up to the capacity of the machine.

* * *

Buttermilk for Ice Cream

Professor D. M. Smillie, who has produced a first-class buttermilk for the baking industry, has adapted this to give a sweet milk-like liquid suitable for the manufacture of ice cream. Its use in war-time ice cream, it is stated, will enhance the food value of this product and help to solve the problems of the ice cream manufacturer.

* * *

Smithfield Meat Trades Institute

The new address of the Smithfield Institute is Eagle Court, Johns Lane, London, E.C. 1.

Bakers and Night Work

The demand by the Scottish operative bakers for the abolition of night work is to be maintained. Mr. Donald MacGregor, presiding at the annual delegate meeting of the Scottish Union of Bakers, Confectioners and Bakery Workers held at Girvan recently, commenting on Mr. Ernest Bevin's view that elasticity was required in the matter of hours and that this could best be arranged between unions and employers, said that Mr. Bevin did not know the baking employers and their continual evasion of any effort to negotiate conditions applicable to all and binding on their association members.

The union was still in touch with the British T.U.C., he said, and was determined to prove that the abolition of night baking would be a national asset.

A resolution moved by Mr. D. Carmichael, Glasgow, urged the Government as a war-time measure to abolish night-baking between 10 p.m. and 4 a.m. Disappointment that the English Bakers' Union was concentrating on securing a 12-hours-old bread order was expressed by Mr. J. L. Brown, Edinburgh. There was a direct split between the two unions, and the remedy was for the two executives to meet.

Mr. J. J. Thomasson, general secretary of the English Union, made it clear that the decision of the joint council of the English and Scottish unions was that if they did not succeed in getting Mr. Bevin to abolish night baking the English Union reserved the right to go forward meanwhile for a 12-hours-old bread order.

But the English Union, said Mr. Thomasson, still intended to collaborate with the Scottish Union and do everything possible to have night baking permanently abolished.

The resolution was adopted unanimously. A resolution in favour of a 12-hours-old bread order was remitted to the executive.

The Trade Board recommendation that work should go on until the danger-imminent signal is given and that time-and-a-half rate should be paid only for time worked in excess of the normal hours after the alert period was accepted by the conference.

* * *

Industrial Radiology Group

The formation of an Industrial Radiology Group under the auspices of the Institute of Physics is announced. Its object is to provide a medium for the exchange of information on the practice of radiography and X-ray crystallographic analysis in industry. A committee has been appointed representing those employing X-rays in industry and the manufacturers of industrial X-ray apparatus and films. Membership of the Group will be open to all interested, whether at present members of the Institute of Physics or not. Fuller details will be published as soon as the Constitution has been formulated. Those interested may register their names with the Honorary Secretary of the Group, Dr. L. Mullins, A.Inst.P., of the Research Laboratories, Kodak Ltd., Harrow, Middlesex, who will send further information as soon as possible.

Fruit Syrups in Canada

Soda "pop" with a "pop" but no fresh-fruit flavouring may be the order for the duration of the war in Canada. Importation of all fruit juices into Canada from non-sterling countries has been banned, but fresh fruits are allowed to enter. Concentrated fruit syrups for use in soft drinks are not made in Canada. "Fruit-flavoured drinks have become very popular during the past five years," said Roy H. MacDonnell, of Canada Dry Ginger Ale. "At one time synthetic flavours were widely used, but the public taste has become more discriminating. It is much cheaper to import the concentrated syrups as so much of the fruits themselves would be thrown away."

C. H. Berner, of O'Keefe's, admitted officials were "worried", but said every effort would be made to find sources within the Empire.

"We have always tried to give preference to British possessions in our purchases of juices, and we will increase this endeavour. Orange juice is the flavour mostly imported from the United States, and it will be difficult to find another source," he explained.

* * *

New Tuberculin Test

A deputation, representative of the Tuberculin Tested Milk Producers' Association, the Scottish Association of Certified and T.T. Milk Producers, the English Guernsey Cattle Society, the Red Poll Cattle Society, the English Jersey Cattle Society, the British Friesian Cattle Society, the Shorthorn Society, the Dexter Cattle Society and the Kerry Cattle Society was received by the Minister of Agriculture.

Representations were made to the Minister on difficulties that had arisen following the introduction and use of the Weybridge tuberculin.

The Minister promised that the present practice of interpretation of the tuberculin tests at head office, which unavoidably involves some delay in action being taken by the farmer where necessary, will be discontinued at an early date and arrangements required for the decentralisation of this work are being made.

The Minister undertook that no further change in the tuberculin to be used should be made without prior announcement to the interests concerned.

* * *

Temperature and Pressure Control

A new bulletin about their air-operated temperature and pressure controller (Model 90) has just been produced by Bristol's Instrument Co., Ltd.

This controller is of the non-indicating, non-recording type and uses compressed aid as the operating medium. It has been designed for use where a chart record is considered unnecessary or where recording instruments are already in use.

Among the applications of the instrument in the food industry are: on bake ovens in bakeries, on smoke houses in packing plants, on open tank cookers, on retorts, on bottle sterilisers and washing machines.

Overseas Publicity

We believe that all overseas publicity should be at the discretion of the principal rather than the agent, and that an "intimatory campaign" should be launched immediately agency or branch arrangements are made. By "intimatory" we mean pronouncements to the effect that your goods will shortly be available. We know it has been the policy of many British firms to defer advertising until a year or more elapses and then a sum is allocated on the year's business. This is poor policy. It discourages the agent, is certainly not calculated to earn distributor sympathy, and severely retards the broad development of sales.

Where a market is already well catered for with lines kindred to yours which have been long established and well publicised, a newcomer cannot hope to get a footing without a liberal marketing policy right at the inception. Give your agent, then, first-class catalogues, showcards, generous samples and some introductory publicity.—*From Export Marketing Bulletin No. 2. Gordon and Gotch, Ltd.*

* * *

Stopping Fuel Waste

Ninety million tons seems a lot of coal, but that is the peace-time consumption in this country for steam-raising, and this amount must be considerably exceeded in war-time.

More than half of this—about fifty million tons—is burned in industrial boilers, and it is possible, by improved operating and maintenance conditions *alone*, to effect a saving of at least 10 per cent. in the majority of these plants with a minimum expenditure of time and money. More and more coal is required by factories engaged on war work, and the railways must not be burdened by having to carry unnecessary tonnage. If four million tons of coal were saved some 10,000 wagons would be thereby released for the transport of essential supplies.

A little booklet entitled *The Operation and Maintenance of Hand-Fired Steam Boilers Using Bituminous Coal* has recently been issued by the Coal Utilisation Joint Council, giving hints on the avoidance of fuel waste.

* * *

Mr. G. V. Downer

Mr. G. V. Downer, founder and late managing director of G.V.D. Illuminators, Ltd., now in voluntary liquidation, is carrying on the work of lighting consultant in his own name at 29, Torrington Square, W.C. 1.

He is the owner of the patents under which the late company was licensed, and he has also acquired the goodwill and stock of the company, which is considerable, and includes many exceptionally efficient and economical lighting fittings, reflectors, etc.

* * *

Sturtevant Engineering Co., Ltd.

The London Sales Office of the Sturtevant Engineering Co., Ltd., is now at Bush House, Aldwych, W.C. 2 (Telephone, Temple Bar 1961) and the head office at 25, Worcester Road, Sutton, Surrey; Telephone, Vigilant 2275; Telegrams, Sturtevant Sutton.

COMPANIES

Associated Biscuit Dividend

A final dividend of 2 per cent. on the Ordinary, payable July 1, was announced by the Associated Biscuit Manufacturers, Ltd. This makes a total of 4 per cent., the same as the previous year's rate.

* * *

Foster Clark

Foster Clark, Ltd., announces an interim of 7½ per cent. Interims have been at this rate for many years, and since 1934 final dividends have been unchanged at 12½ per cent.

* * *

Lovell and Christmas

The Board of Lovell and Christmas, provision merchants, etc., recommend a first and final dividend on Ordinary of 6 per cent. (1s. 2·2-5d. per share), less tax, for the year ended June 7, the same as for the previous year.

The debenture interest was paid on the due date—July 14—but as the report and accounts will be delayed it will not be possible to pay the dividends on the Preference and Ordinary at the same time as the debenture interest. These dividends will be paid after the ordinary meeting, which will be held as soon as practicable.

* * *

Virol, Limited

Speaking at the forty-first annual general meeting of Virol, Ltd., Lord Luke, K.B.E. (chairman of the company), said that there was a further improvement in the company's trade, due in a large measure to the increased recognition, both by the medical authorities and the public, of the high nutritional value of Virol. In fact, the sales have compelled the introduction of a scheme of rationing for all orders both for the public and the welfare centres.

Turning to the accounts, Lord Luke said: "You will have noticed that the gross trading profit amounts to £168,045, as compared with £146,441 for the previous year, and after deducting all operating expenses, but before providing for excess profits tax, the profit comes out at £37,356.

We have shown in the appropriation account that of this profit of £37,356 we have had to set aside £22,000 for excess profits tax, representing 60 per cent (including income tax 80 per cent.) of the year's profits, and leaving us a figure insufficient to cover the Preference and the usual Ordinary dividends. This was due to the fact that our E.P.T. standard year is based on one of our worst profit periods for many years. The directors, however, have decided to recommend the payment of the usual dividend of 10 per cent. on the Ordinary shares, drawing on the carry-forward to meet the deficiency."

* * *

Bovril Dividend

The directors of Bovril have resolved to pay an interim dividend of 2½ per cent., less tax, on the Deferred shares in respect of 1941. The warrants for this and the half-yearly dividends on the 4½ per cent. Pre-Preference, 6 per cent. Preference, and 7 per cent. Ordinary will be posted July 31.

The corresponding interim last year on the Deferred was 2½ per cent. and final rate 5½ per cent., making 8 per cent. The Deferred (£1) are quoted at 1 3-22.

* * *

Holbrooks, Ltd.

Presiding at the annual meeting of stockholders of Holbrooks, Ltd., held at the Grand Hotel, Birmingham, Mr. J. L. Deverell (chairman) explained in detail the reconstruction and reorganisation plans which had become necessary and the progress made under present building restrictions.

Despite great difficulties in export trade, the largest monthly export total made by the company was shipped since reorganisation was planned. Their Australian company had again reached a new high level of sales, and here the recently installed glass and tin-making plants were proving a sound investment.

Unfortunately, Government control of wages and the difficulty in passing on to customers the rise in price of raw materials had reduced profits there, as in England. Also their extensive Government contracts have been entered into under less favourable terms than those ruling in normal trading.

The decline in the profit and loss account was due to conditions already referred to, and to increased manufacturing costs. Further, replacement of lost stock on a rapidly rising market had been most expensive, while increased taxation and special war-time expenditure accounted for an additional £11,400.

* * *

The Farmers' Club

The Farmers' Club was founded at a meeting at the Royal Show at Cambridge in 1840 by a few members of the R.A.S.E. and the Smithfield Club, who thought there should be a permanent meeting-place in London for the interchange of views on agriculture.

For the next forty years the club premises were at many different London hotels, until, in 1903, the Club moved to its present address in Whitehall Court, close to the Ministry of Agriculture and the Houses of Parliament.

In addition to the usual amenities in the club rooms, including an excellent agricultural library, dining and drawing rooms, bedrooms, and a squash racquets court in the building are available for the use of members.

A feature of the Farmers' Club is its practice, started in 1844, of meetings at which papers are read by recognised leaders in agriculture, followed by a discussion. These are fully reported in the journal of the Club, which is circulated free to members' universities and other institutions, as well as people interested in agriculture in all parts of the world, who receive it by subscription.

Of recent months the Club has added considerably to its library, and to enable its 1,320 members to take the fullest advantage of the wealth of information available, it has been decided to institute a loan service by which members are able to borrow books without charge.

* * *

London Pepper Stocks

The London pepper trade, with stocks much reduced, states that even if import licences were granted some time must elapse before the arrival of fresh supplies.

Quotations are firmer. Buyers are bidding 13d. per pound for white Muntol and 7½d. per pound for black Lampong, which represents rises respectively of approximately 1d. and ½d. per pound in a few days.

* * *

Mr. P. Guthlac Jones

Mr. P. Guthlac Jones, until a few years ago chemist in charge of the Board of Trade dyestuffs testing laboratory in Manchester, has been appointed in a part-time capacity to succeed the late Mr. C. H. Heap as makers' Technical Adviser, makers' Technical Representative on the Joint Technical Committee of the Association of British Chemical Manufacturers and Colour Users' Association, and Secretary of the Dyestuffs Group of the Association of British Chemical Manufacturers.

* * *

G. W. Marsden, Ltd.

G. W. Marsden, Ltd., request that all correspondence be in future addressed to: Cross Lane, Primrose Hill, Huddersfield. Telephone No.: Hudd. 2751.

* * *

The Institute of Physics

The emergency address of the Institute of Physics is The University, Reading, Berks.

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OBITUARY

Dr. R. Robison, F.R.S.

Dr. Robert Robison, F.R.S., the eminent biochemist, has died at the age of 57.

The son of Robert and Jessie Thomson Robison, he was educated at University College, Nottingham, and at Leipzig. After holding lectureships at Galway and Nottingham, he joined the Lister Institute as an assistant biochemist in 1913, and became head of his department at the institute in 1931. Dr. Robison was also Professor of Biochemistry at London University. He was made F.R.S. in 1930, was Herter lecturer at New York in 1931, and received the Baly medal of the Royal College of Physicians in 1933. During the last war he served abroad as a captain in the R.A.M.C. In 1910 he married Ethel Ray Walker, and there was one daughter of the marriage.

* * *

Henry Lane Thornbery

Henry Lane Thornbery, at Grosvenor Lodge, Seaford, Sussex, has died at the age of 78 after a very long illness.

INFORMATION AND ADVICE

Canned Salmon Dishes—*Alpha*-Naphthalene Acetic Acid for Potatoes—Information Supplied—Information Required

Canned Salmon Dishes

7,180. *Could you let us have a recipe for using canned salmon in an economical but attractive way for canteens?*

We give you two recipes which make very attractive dishes. The original ingredients are shown, but the lemon juice will have to be replaced by vinegar and flavouring essence. Naturally, changes may be rung on these recipes. The quantities given will suffice for fifty people.

SALMON CASSEROLE.

Ingredients.	*Weight or Measure.*
Salmon	4 1-lb. cans
Lemon juice	4 tablespoons
Potatoes, cooked	2 lb. 4 oz.
Peas	2 cans
Butter or margarine	8 oz.
Flour	5 oz.
Milk	2½ qts.
Salt	2 tablespoons
Breadcrumbs, buttered	6 oz.

1. Remove bone and skin from salmon, flake.
2. Combine salmon, lemon juice, cooked potatoes and peas.
3. Make a white sauce of butter, flour, milk and salt.
4. Alternate layers of white sauce and fish mixture in greased baking-dish.
5. Sprinkle top with buttered breadcrumbs.
6. Bake thirty minutes in a moderate oven (375° F.).

SALMON LOAF.

Ingredients.	*Weight or Measure.*
Milk	3½ cups
Breadcrumbs, soft	1¼ lb.
Butter or margarine	6 oz.
Eggs	13 oz.
Lemons, juice and rind	3 oz.
Onion, minced	3 teaspoons
Salt	3 teaspoons
Pepper	1 teaspoon
Salmon	6 No. 1 cans

1. Heat milk, add breadcrumbs and butter, stir to make a paste.
2. Add beaten egg yolks, lemon juice and rind, minced onion, salt and pepper to salmon; combine with milk mixture.
3. Fold in beaten egg whites.
4. Form into four loaves (4½ by 9 in.).
5. Bake thirty-five minutes in moderate oven (375° F.).

Alpha-Naphthalene Acetic Acid for Potatoes

7,328. *In your February issue, in an article on "Colour in Potato Chips", mention is made of the use of the methyl ester of* alpha-*naphthalene acetic acid as an agent for inhibiting the sprouting of potatoes. Can you let us know the concentration used and how exactly it is applied?* (Dublin.)

According to the paper by J. D. Guthrie in "Contributions from the Boyce Thompson Laboratory" (mentioned in *Plant Growth-Substances*, by Hugh Nicol: Leonard Hill Ltd., 1940, 7s. 6d.), no special concentration is mentioned. It is stated that a 5-lb. brown paper bag was sprayed inside with a solution of 0·48 gm. of the methyl ester of *alpha*-naphthalene acetic acid (the acid itself does not appear to be effective in this way) in acetone (amount not stated). After the acetone had evaporated, six whole tubers were placed in the bag, the top folded over and fastened with paper-clips. The bag was then placed in a 12-lb. bag also folded over and fastened. After eleven days only three buds were growing on the treated tubers, while twenty-four buds were growing on a similar lot treated with acetone. A spray consisting of 1 gm. of naphthalene acetic *acid* (which, unlike the methyl ester, is not volatile), 50 millilitres of olive oil and 1 litre of acetone applied on the tubers was effective in inhibiting the growth of buds on cut tubers stored at 10° C. (50° F.). The solution of the acid must be sprayed so as to come into actual contact with the tubers; the ester, being volatile, may be placed inside the container so that the vapour permeates the whole. We are not aware of any large-scale tests with either substance on potatoes.

If you care to write to the Imperial Bureau of Soil Science, Harpenden, Herts, England, you could have a typewritten copy of the paper made for a nominal fee.

Information Supplied

7,142. *I intend starting a lime-juice extracting factory in miniature scale—i.e., about 50 gallons daily output, and this will be increased as demand increases. My requirements are: (1) Cutting machine for limes of 1½ in. to 2½ in. (2) Juice-extracting machine or press, with arrangement for elimination of seeds and skins. (3) Filter, and (4) bottle filler. Items (1) and (2) should be electrically driven. Please put me in touch with the suppliers of the above.* (India.)

This was done.

7,144. *In a recent issue you mentioned having received a full range of booklets showing modern types of machinery for the biscuit line. As we have got to develop our biscuit line, we should be glad to know the name and address of this firm.* (Trichinopoly.)

This was done.

7,150. *We are interested in the manufacture of tomato powder and should be glad if you would supply us with information regarding the entire process in detail for drying tomatoes. We should also be glad if you could furnish us with samples of artificial essence and colour for tomato powder, with prices and the names of their manufacturers.* (China.)

Names of firms specialising in drying plant and machinery were given, together with the names of two firms to whom they could apply for samples of artificial essence and colour.

7,154. *We have on hand a quantity of calcium acid phosphate, and we should be obliged if you could give us any information as to how this might be utilised.* (Glasgow.)

This was done.

7,157. *It is desired to purchase a vacuum gauge for testing the vacuum of canned foodstuffs. Can you please give me the name of a manufacturer supplying this type of gauge?* (London.)

Names were given.

7,162. *We should be much obliged if you could put us in touch with manufacturers of machines suitable for cutting raw boned beef into pieces from 1 to 1½ in. square.* (Dublin.)

This was done.

7,168. *I am anxious to ascertain the manufacturers of the plant necessary for the preparation of shell eggs for rendering them suitable for freezing in tins. I understand that the yolk and albumen have to be passed through a sieve, and that in order to do this a pump is utilised. Any information you can give me would be much appreciated.* (London.)

The name of a firm in a position to supply this equipment was given.

Information Required

7,572. *We are manufacturers of crystallised fruits, and understand that there is a new method of coating the preserved fruit with sugar crystals by rubbing the fruit through sugar first, and then passing it under a series of steam jets to fix the crystal.*

We have tried it out in a small way, but find that in damp weather it sweats badly.

Do you know the process or can you suggest some way to seal the coating?

RECENT PATENTS

These particulars of new patents of interest to readers have been selected from the "Official Journal of Patents", and are published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

Abstracts of Recent Specifications

Group Abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, either sheet by sheet as issued on payment of a subscription of 5s. per Group Volume, or in bound volumes price 2s. each.

Improvement in and Relating to the Manufacture of Syrups

A method of producing a malt-like syrup from corn steep water and corn syrup comprising first substantially neutralising the steep water to effect precipitation of the heat coagulable proteins, filtering to remove the precipitated materials, blending the filtered steep water with a corn syrup, concentrating the resulting liquid to produce a syrup of the desired consistency and thereafter heating said syrup sufficiently to impart to the syrup a characteristic malt aroma and flavour. The steep water is first neutralised to a *p*H of 5 to 7, and the concentrated syrup is heated to a temperature of at least 150° F. to produce the desired malt aroma and flavour.

The admixture of filtered steep water and corn syrup is slightly solidified before concentrating, and the concentrated syrup is heated to a temperature of about 165° F. for a period of about 5 to 30 minutes. The admixture of filtered steep water and corn syrup comprises about one part by volume of said steep water and three parts by volume of said corn syrup.

A malt-like syrup is produced by heating together corn steep water and a starch conversion sugar solution, the improvement which comprises oxidising sulphur dioxide and compounds thereof present in the steep water by treating the steep water with an oxidising agent selected from the group consisting of potassium chlorate and hydrogen peroxide, substantially neutralising the steep water to effect precipitation of the heat coagulable proteins therein, and removing the precipitated materials before the steep water is mixed with the starch conversion sugar solution so that said coagulated proteins and sulphur dioxide will not prevent formation of the desired malt aroma and flavour in the final reaction product of the steep water and sugar solution.

533,404. Leo Stein, James Francis Walsh, Haskell Cohn Needle and American Maize-Products Company.

Improvements in Moulding Sweetmeats

1. A method of making a sweetmeat centre preparatory to coating it with chocolate, consisting in stretching a rubber skin over a perforated mould, removing air from the mould below such skin so that said skin is drawn into close contact with the interior of the mould, filling the mould with fluid material to form the sweetmeat centre, cooling said mould and contents to bring the contents to a semi-solid condition, and then allowing air to enter the mould below the skin to allow the latter to eject the cooled centre for subsequent coating.

2. A method of making cream, nougat or jelly centres preparatory to coating, for the manufacture of coated sweetmeats, which consists in stretching a skin of rubber over a mould plate having a plurality of perforated individual moulds or depressions for the bodies, removing the air from the individual moulds through said perforations to allow the stretched skin to be forced into close contact with the interior of said moulds, filling the moulds with cream, nougat or jelly, cooling it while in the moulds to bring it to a semi-solid condition and then allowing air to enter the moulds through the said perforations for the purpose of allowing the stretched skin to eject the semi-solid bodies from the moulds, for subsequent coating with chocolate.

532,873. Theodore Daniels.

Latest Patent Applications

1229. DAVIDSON, A. D.: Electric cooking and heating apparatus.
1330. CAMPBELL, C. E.: Preservation of eggs.
1404, 1405. ELDORADO ICE CREAM CO., LTD., and APS, J. E.: Manufacture of ice-cream.
1406. AFRICAN SISAL AND PRODUCE CO., LTD., RAMSDEN, SIR J. F., WALSH, C. L. and MAY, J.: Chemical extraction of vegetable matter.
1421. FARISH, T. G.: Pressure cookers.
2132. MARATHON PAPER MILLS CO.: Receiving and supporting receptacle for ice-cream cartons.
2133. MARATHON PAPER MILLS CO.: Dispensing-storage receptacle for ice-cream cartons.
2178. CRIBB, H. H.: Machines for manufacture of egg pulp.
2348. GREEN, R. M.: Apparatus for the cooling, etc., of liquids.
2429. STOCKHAMER, P.: Treatment of fish.
2644. TWEEDALE, C. L.: Manufacture of cereal foodstuffs.
2824. SMITHFIELD AND ARGENTINE CO., LTD., CORPORACION ARGENTINA DE PRODUCTORES DE CARNES, and BREWSTER, J. A.: Preservation of food.
3186. LEWIS, E. S.: Extraction of sugar from sugar beet, etc.
3294, 3295. VAUGHAN NOVELTY MANUFACTURING CO.: Device for peeling vegetables, etc.
3981. PERMUTIT CO., LTD., and HOLMES, E. L.: Purification of gelatine, etc.

Specifications Published

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

533,300. AKTIEBOLAGET SEPARATOR, LEVER BROS., and UNILEVER, LTD., and BOSTOCK, B. R.: Method of recovering oil and meat-meal from whale meat.
533,404: STEIN, L., WALSH, J. F., NEEDLE, H. C., and AMERICAN MAIZE-PRODUCTS CO.: Manufacture of syrups.
534,787. FOOD DISPENSER CO.: Dispensers.
535,061. BUENSOD-STACEY AIR CONDITIONING, INC.: Centrifugal refrigerating apparatus.
535,231. FREEMANTLE, H. R., and PERGA, LTD.: Manufacture of containers for milk and other liquids. (Cognate Application, 7859/40.)
535,321. KRIM-KO CO.: Chocolate or cocoa drinks.
535,448. WALSH, J. F., KINZINGER, S., GOODMAN, A. H., and AMERICAN MAIZE-PRODUCTS CO.: Non-bitter starch conversion sugar products, and process of manufacture.
535,456. HUTCHESON, W. W., and MASON, W. C.: Cooking potatoes, herbs and other vegetable substances.

TRADE MARKS

The list of trade marks of interest to readers has been selected from the "Official Trade Marks Journal" and is published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

GLORIETTA.—607,680. Canned tomato juice, being a non-alcoholic beverage. Santa Clara Packing Company, 620, North Eighth Street, San José, California, United States of America; Packers and Canners. Address for Service is c/o **Reginald W. Barker and Co.**, Vulcan House, 56, Ludgate Hill, London, E.C. 4. To be Associated with No. 607,679 (3229) xxix. (By Consent.)

GYP.—611,202. Anchovy, mayonnaise, piccalilli, pickles, soup extracts, soup powder, concentrated soups, and soup tablets. **Fletchers Sauce Co., Ltd.**, The Sauce Works, Barlby Road, Selby Yorkshire; Manufacturers. To be Associated with No. 611,158 (3253) ii and another.

CERELOSE.—611,951. Powdered glucose (for food). **Corn Products Company, Ltd.**, Bush House, Aldwych, London, W.C. 2; Starch Manufacturers.

JULSMINE.—612,859. All goods included in Class 29 but not including fish, poultry, game and meat extracts. **Joseph Bostock, Ltd.**, 2, Barton Street, Beeston, Nottingham; Provision Merchants.

PARAMOUNT.—613,036. Pepper. **Stokes and Dalton, Ltd.**, Victoria Spice Mills, York Road, Leeds; Manufacturers and Merchants. No. 613,249 (3280) xxx and another.

FRUSIMA.—613,248. Fruit substitutes prepared from vegetables for use as ingredients in cakes and confectionery; dried fruits, vegetable preserves, preserved vegetables, cooked vegetables and dried vegetables. **Unicream, Ltd.**, 39, Dean Road, Manchester, 3; Food Manufacturers. To be Associated with **FRUSIMA.**—613,249. Crystallized sweets, fruit flavourings (other than essential oils), flavourings for cakes and sweetmeats. **Unicream, Ltd.**, 39, Dean Road, Manchester, 3; Food Manufacturers.

NEW COMPANIES

George Jackson (Swindon), Limited. (365785.) To take over the bus. of manufacturing confectioners cd. on as "G. Jackson," at 8, Commercial Road, Swindon. Nom. cap.: £1,200 in £1 shares. Dirs.: Not named. Subs.: A. Leonard, 52, Westolcot Road, Swindon; W. J. Knight, 111, Bath Road, Swindon.

Leopold and Son, Limited. (365924.) 85, High Street, Cheltenham. To carry on the bus. of biscuit mnfrs., bakers, etc. Nom. cap.: £10,000 in £1 shares. Dirs.: F. B. Leopold, Diana E. Leopold and F. P. Leopold, all of 138, Leckhampton Road, Cheltenham.

Mersey Seeds and Cereals Co., Limited. (365717.) 3, Richmond Terrace, Blackburn. Nom. cap.: £1,000 in £1 shares. Dirs.: F. A. Astley, 217, Shear Brow, Blackburn; J. H. Moore, Ingledene, Dill Hall Lane, Church, Lancs.

A. M. Ashford, Limited. (365776.) To carry on the bus. of mnfrs. of and dlrs. in confectionery, sweets, biscuits, foods, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: To be appointed by the subs. Subs.: E. J. Long, 17, Cotswold Road, Sheffield, 6 (company acct.); S. Harrison, 8, Keyworth Road, Sheffield, 6 (clerk).

Ernest A. Breminer, Limited. (365728.) 2, Idol Lane, E.C. 3. To carry on the bus. of coffee mchts. and agents, expert and import mchts., etc. Nom cap.: £1,000 in £1 shares. Dirs.: A. A. Breminer, 157, Lichfield Court, Richmond, Surrey. M. M. West, 4, Greenhalgh Walk, N. 2.

Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C. 2.